TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1927

No. 509

SAUL M. NECTOW, PLAINTIFF IN ERROR,

vs.

CITY OF CAMBRIDGE AND INSPECTOR OF BUILDINGS OF THE CITY OF CAMBRIDGE, JEREMIAH F. DOWNEY

IN ERROR TO THE SUPREME JUDICIAL COURT OF THE STATE OF MASSACHUSETTS

FILED SEPTEMBER 3, 1927

(32,961)

R3
R2
B1
B2
B3
U2
W6.
PRINCETON AVE.
AMHERST ST.
CHARLES RIVER ROAD
CHARLES RIVER PARKWAY
VASSAR ST
ALBANY ST
BRANCH R.R.
BOSTON & ALBANY
LANDSDOWNE
STATE
Center Line
Ford
U. Office
MASSACHUSETTS AVE.
PUTNAM
CHESTNUT
HAMILTON
PROSPECT
AUBURN
FRANKLIN
WILLIAM
CAMBRIDGE
UPTON
WARLAND
PARK
MAIN
RIVER

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JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., NOVEMBER 22, 1927

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IN SUPREME JUDICIAL COURT OF MASSACHUSETTS

WRIT OF ERROR AND RETURN—Filed August 4, 1927

UNITED STATES OF AMERICA, ss:

[Seal of the United States District Court, Massachusetts.]

The President of the United States to the Honorable the Judges of the Supreme Judicial Court of the Commonwealth of Massachusetts, holden at Boston, within and for the Commonwealth of Massachusetts, Greeting:

Because, in the record and proceedings, as also in the rendition of the judgment of a plea which is in the said Supreme Judicial Court before you, or some of you, being the highest court of law or equity of the Commonwealth of Massachusetts in which a decision could be had in the said suit between Saul M. Nectow, Plaintiff, and City of Cambridge and Inspector of Buildings of the City of Cambridge, Jeremiah F. Downey, Defendants, wherein was drawn in question the validity of a treaty or statute of, or an authority exercised under, the United States, and the decision was against their validity; or wherein was drawn in question the validity of a statute of, or an authority exercised under said State, on the ground of their being repugnant to the Constitution, treaties, or laws of the United States, and the decision was in favor of their validity; a manifest error hath happened, to the great damage of the said Saul M. Nectow, as by his complaint appears.

We being willing that error, if any hath been, should be duly corrected, and full and speedy justice done to the parties aforesaid in this behalf, do command you, if judgment be therein given, that then under your seal, distinctly and openly, you send the record and proceedings aforesaid, with all things concerning the same, to the Supreme Court of the United States, together with this writ, so that you have the same in the said Supreme Court, at Washington,

within thirty days from the date hereof, that the record and proceedings aforesaid being inspected, the said Supreme Court may cause further to be done therein to correct that error, what of right, and according to the laws and customs of the United States, should be done.

Witness, the Honorable William Howard Taft, Chief Justice of the United States, the 3rd day of August in the year of our Lord one thousand nine hundred and twenty-seven.

James S. Allen, Clerk of the District Court of the United States, District of Massachusetts.

Allowed by Henry H. Braley, Senior Associate Justice of the Supreme Judicial Court of Massachusetts, acting under General Laws, c. 213, s. 1, owing to the illness of the Chief Justice.

COMMONWEALTH OF MASSACHUSETTS, ss:

And now, here, the Judges of the Supreme Judicial Court make return of this writ by annexing hereto and sending herewith, under the seal of the said Supreme Judicial Court, a true and attested copy of the record and proceedings in the suit within mentioned, with all things concerning the same, to the Supreme Court of the United States, as within commanded.

In testimony whereof, I, John F. Cronin, Clerk of said Supreme Judicial Court, have hereto set my hand and the seal of said court this twenty-third day of August, A. D. 1927.

John F. Cronin, Clerk. (Seal.)

[File endorsement omitted.]

[fol. 3] In Supreme Judicial Court of Massachusetts,
Suffolk County

In Equity

Saul M. Nectow, Plaintiff,

v.

The City of Cambridge and Inspector of Buildings of the City of Cambridge, Jeremiah F. Downey, Defendants

Report

This case came on to be heard before me upon the objections to the master's report. I ordered a decree to be entered overruling the objections and confirming the report and now report the case upon the bill as amended, answer, master's report and objections thereto for the determination of the Full Court.

Edward P. Pierce, Justice Supreme Judicial Court.

September 21, 1926.

In Supreme Judicial Court of Massachusetts

Bill of Complaint—Filed December 31, 1924

1. The plaintiff is a resident of Boston aforesaid. The defendant city is a municipal corporation, situated in the County of Middlesex, and the defendant Downey is the duly-qualified Inspector of Buildings and is the official authorized to issue permits for the erection of buildings in said city, and is the head of the Building Department of said city.

[fol. 4] 2. The plaintiff is the owner of a tract of land located in Cambridge in the county of Middlesex and described as follows:

Beginning at the southerly junction of Brookline and Henry Streets and running southeasterly along the southerly side of said Henry Street One Hundred (100) feet; thence turning and running parallel with the line of Brookline Street Two Hundred Sixty-four (264) feet more or less

to land of the Ford Motor Company; thence turning and running westerly by the land of the said Ford Motor Company about seventy-five (75) feet to Brookline Street; thence turning and running along said Brookline Street Three Hundred and Four and Seventy-five one hundredths (304.75) feet more or less to the point of beginning. Containing about 29,000 square feet more or less.

Said tract was until the acts of the defendant city herein set forth part of a larger lot, likewise owned by the plaintiff, the balance of which lies southeast of the said tract and is bounded on the northeast by Henry Street aforesaid 222 feet and on the southwest by the Ford Motor Company aforesaid. Said larger lot is hereinafter referred to in paragraph 8.

All of said land before the acts herein set forth was unrestricted land, and vacant, except that upon the tract specifically described there is now an old and abandoned dwelling house of no value. The whole tract is of great value for industrial and business uses but has no, or little, value for residence.

The defendant City of Cambridge on November 2, 1915, adopted Plan B form of city government and has since been governed by the provisions of said Plan B, as provided by Chapter 267 of the Acts of 1915.

3. On December 31, 1923, an ordinance entitled "Construction, Use, Maintenance and Inspection of Buildings" was voted upon by the City Council of Cambridge; eight councillors voted yes, five voted no, and two were absent, The ordinance was declared to be passed to be ordained, and is so recorded upon the records of the City Council. The said ordinance was thereafter, as appears by the said records, approved by the mayor. The ordinance purports to take effect on its passage. It is intended to operate as a zoning ordinance, dividing all the territory within the city into three districts, Residence, Business and Unrestricted districts. Each of said districts is further graded and subclassified into four districts within said districts and subdistrict buildings of specified kinds and for specified purposes only may be erected.

[fol. 5] Section 1 of said ordinance provides:

The provisions of this ordinance shall apply to the construction, alteration, removal, equipment, occupation, height, area, location and maintenance of all buildings as hereinafter set forth in the City of Cambridge but not to existing buildings when specifically treated, nor to bridges, quays, wharves, railway stations, buildings on land ceded to the United States, building owned or occupied by the Commonwealth or Middlesex County, portable school buildings erected and maintained by the city, nor to voting booths.

In interpreting and applying the provisions of this ordinance, they shall be held to be the minimum requirements adopted for the promotion of the health, safety, convenience and welfare of the inhabitants. This ordinance shall not repeal, abrogate, annul or in any way impair or interfere with any existing provision of law or ordinance other than an ordinance entitled "Construction, Maintenance and Inspection of Buildings" which is hereby repealed, or with any rules, regulations or permits previously adopted or issued or which shall be adopted or issued pursuant to law relating to the use of buildings or premises; nor shall this ordinance interfere with or abrogate or annul any easements, covenants or other agreements between the parties; provided, however, that where this ordinance imposes a greater restriction upon the use of buildings or premises or upon height of buildings or requires larger yards, courts, or other open spaces than is imposed or required by such existing provision of law or ordinance, or by such rules, regulations or permits or by such easements, covenants or agreements, the provisions of this ordinance shall control.

Section 12 provides:

For the purpose of regulating and restricting the location of trades and industries and the location of buildings designed for specified uses, the City of Cambridge is hereby divided into three classes of use districts: Residence districts, business districts and unrestricted districts, as shown on the zone map which accompanies this ordinance and is hereby declared to be part hereof. The use districts designated on said map are hereby established. The use district designations and map designation rules which

accompany said zone map are hereby declared to be part thereof. No building, structure or premises shall be erected or used for any purpose other than a purpose permitted in the use district in which such building or premises are located.

In a residence district no building shall be erected other than a building, with its usual accessories, arranged, intended or designed exclusively for one or more of the following classes of use, as defined in Section 10:

(1) Residence Buildings A, B, C, D.

(2) Public Buildings (A), except detention buildings, B, C, D, and buildings accessory to Public Buildings D.

[fol. 6] (3) Business Buildings F.

(4) Garages for not more than two motor vehicles and with no space for commercial trucks.

(5) College, University or Technical School Buildings and buildings accessory to them.

(6) Accessory Buildings not over one and one-half stories high on the same lot with any of the above Residences or Public Buildings; provided that, on a street occupied by street car tracks, between a business building of Class A or B, as defined in Section 10, and an intersecting street not more than 100 feet distant from such building or between two such business buildings of Class A or B nor more than 100 feet apart, a business building of Class A or B not extending farther from the street occupied by street car tracks, nor higher than such building or either of them shall not be excluded.

In a residence district no building or premises shall be used for any use other than use above specified, for which buildings may be erected and for the accessory uses customarily incident thereto unless heretofore so used. The term accessory use shall not include a business outside the building to which it is accessory or which occupies a total floor area in excess of 25% of the floor area of one story of such building, or which by reason of the appearance of the buildings or premises, or the emission of odor, smoke, dust or noise or in any other way is objectionable or detrimental to the residential character of the neighborhood or which involves features in design not customary in buildings for the above uses or any structural alteration of the building.

Where any portion of a residence district lies within the boundaries of a Building District 4, as designated on the

zoning map, no building in such portion of a residence district shall be used or erected which is arranged, intended or designed to be used for any one or more of the following classes of use as defined in Section 10:

(1) Residence Buildings B, C, D, provided, however, that any building to be located between two residence buildings B, not more than 100 ft. apart measured along the street line and excluding from such measurement the width of any intersecting street, may be erected to a height of three stories.

(2) Public Buildings A.

(3) Business Buildings F, except Greenhouses.

In a business district no building or premises shall be used, and no building shall be erected which is arranged, intended, or designed to be used for any one or more of the following classes of use as defined in Section 10:

Business Buildings D, E, except light or power plants of less than 5,000 K. W. hourly capacity.

In a business district no building or premises shall be used, and no building shall be erected which is arranged, intended or designed to be used for any trade, industry or [fol. 7] use that is noxious or offensive by reason of the emission of odor, dust, smoke, gas or noise; but car barns or places of amusement shall not be excluded.

Where any portion of a business district lies within the boundaries of a building district 3 or 4 as defined in Section 16 no building in such portion of a business district shall be used or erected which is arranged, intended or designed to be used for any kind of manufacturing, other than the manufacture of products, the major portion of which are to be sold at a retail on the premises by the manufacturer to the ultimate consumer.

No use permitted in a residence district by this section shall be excluded from any business district.

In an unrestricted district a building may be erected or used for any purpose in conformity with the provisions of this ordinance, and other existing ordinances and laws and regulations.

The whole of said ordinance is incorporated and made part of this bill by reference.

In no section or place in the text of said ordinance is there any specific application of a zone or zoning system to any property or any specific division of the city into dis-

tricts or zones. No person reading the text of said ordinance could determine in what classification or use district any given lot or parcel of land had been placed by the ordinance. The text does not purport to make specific the zoning, except by reference to a zoning plan where the specific zoning is set out, and said plan being identified as a plan which accompanies the text, is by textual provision made part of the ordinance. It is necessary to read or inspect the zoning plan referred to in Section 12 of the ordinance in order to understand what specific property is affected by the zoning ordinance, and that plan by necessary implication should and by express provision of the ordinance must physically accompany and be a part of the ordinance.

The text of said ordinance contains 285 sections and with the plan which should accompany it and be part of it exceeds in length eight octavo pages of ordinary book print. In lieu of publishing the proposed ordinance once in full in one newspaper of the city at least ten days before its final passage, the proposed ordinance purported to be published by the city council in a printed pamphlet consisting of 42 galley sheets bound together and printed at the top of the first page "First Publication No. 568 City of Cambridge In the year One Thousand Nine Hundred and Twenty-three An Ordinance entitled 'Construction, Use, Maintenance and Inspection of Buildings' ".

[fol. 8] 4. The plaintiff on information and belief alleges that the manner of the publication of said printed pamphlet was as follows:

The City Clerk by authority of the City Council caused 500 copies or pamphlets of the text of said ordinance to be printed and placed upon a counter in the City Clerk's office, for distribution among such of the public as should call for them.

No plan accompanied any of the pamphlets, or copies then published. At no time after the beginning of the purported publication as aforesaid of said pamphlet under General Laws Chapter 43, Section 23, and during ten days before the final passage of the ordinance, did any zone map whatsoever accompany the ordinance; during said period no map whatsoever was published by the city council or placed in any designated public place which purported to be the

map which in the ordinance was expressly declared to accompany, or should accompany, the ordinance as a part thereof. The text of the ordinance was not only incoherent and incomplete without the plan, but was mere waste paper, giving the public or the owners of property none of the information relating to zoning and answering none of the purposes, required by the statute. No advertising or publishing of the ordinance prior to its enactment in compliance with law was done. The ordinance was enacted without the essential preliminary public advertisement or publishing required by General Laws Chapter 43.

5. After the aforesaid enactment without publication or advertisement of the said ordinance a plan was brought to the plaintiff's attention by the defendant city officials who claimed and alleged that it, the said plan, was the zoning plan referred to and expressly incorporated by said Section 12 as a part of the Ordinance and that the ordinance as passed divided the city into the districts and classified the use of property according to said plan. This was the first time that the plaintiff had any actual knowledge or notice regarding the pendency or passage of a zoning ordinance.

An inspection of said plan disclosed that it was impossible to interpret the division of the city into zones or districts, or to ascertain the use districts into which the property had been classified without reference to a further document. Said further document is entitled "Cambridge Planning Board Main Features of Zoning Ordinance." This last mentioned document, as the plaintiff alleges on information and belief, was not published as part of said ordinance and plan by the city council for ten days before the passage of the ordinance.

[fol. 9] 6. The plaintiff alleges upon information and belief that said ordinance has never been approved by the attorney-general.

7. An inspection of the ordinance, the zoning plan and the Main Features document disclosed that the tract of land of the plaintiff described by metes and bounds in paragraph 1 of this bill had been classified by Section 12 of said ordinance and said plan and Main Features in a residence district so-called, and its use limited to residences of the third class as set forth in the Main Features document.

The plaintiff says that said enactment is invalid because said ordinance was not published in full at least ten days before its final passage in accordance with General Laws Chapter 43, Section 23, and hence is null and void; and also because it has not been approved by the attorney-general and hence is ineffective; but the defendant city and its Inspector of Buildings are assuming and undertaking to enforce it; have refused to grant the plaintiff a permit for the erection of a building, lawful except for the said ordinance, and have warned him that he or his assigns will not be allowed to erect any building on said land except dwellings; that said land is wholly unsuitable for dwellings, is fit only for business or mercantile buildings; the enforcement of said ordinance is causing substantial damage to the plaintiff, and the threat to enforce said ordinance against said tract has made it unsalable.

8. Before said enactment the plaintiff, being the owner of the larger tract of land referred to in paragraph 2, made and executed an agreement with the Pittsburgh Plate Glass Company, a corporation engaged in the business of manufacturing and distributing plate glass, by which he was to sell and said company was to buy said tract of land, consisting of 51,000 square feet, at a price of $1.25 per foot, a total of $63,000.

At the time of said contract of sale, said tract of land might lawfully be used for any legitimate use, business or enterprise.

The said company was purchasing said property for the purpose of erecting a 2½ to 3 story modern stucco or concrete building to be used for office, warehouse, and local distribution of its plate glass product; the building was to be erected in part on that part of said tract which is affected by said zoning ordinance. No manufacturing was to be carried on, and no objectionable noise would be emitted.

After the alleged enactment of said ordinance, the duly authorized officials of the defendant city warned the plain-[fol. 10] tiff and said company that no permit would be issued for the erection of any building on that portion of said tract 100 feet deep from Brookline Street to be used for any other purpose than residence, because any building used for any purpose other than residence would be violative of said zoning ordinance.

Whereupon the said corporation refused to purchase said tract, and said lot upon which the inhibition of said ordinance falls is now for reasons hereinafter set forth nearly if not quite worthless and unsalable and unavailable for any private use, either for residences, or for business, or for mercantile purposes, and the value of the remaining plaintiff's land has been substantially diminished.

9. By the operation of said ordinance, the tract of land specifically described in paragraph 1 of this bill is placed in R 3 district, the meaning of which is that it may be used only for dwellings, hotels, clubs, churches, schools, philanthropic institutions, greenhouses and gardening with customary incidental accessory uses. Such buildings may be four-story or 60 feet high. Such dwellings, or multiple dwellings, so-called, may have as many apartments or tenements as the builder desires and may be constructed of wood. All other uses of said land is prohibited by said ordinance.

10. The defendant city by said ordinance in its application to plaintiff's said property has not carried out the provisions of General Laws, Chapted 40, Section 25, or exercised the authority granted by said act in such a manner as within constitutional police power will fairly or reasonably promote the health, safety, convenience and welfare of the inhabitants, or lessen the danger of fire.

11. The plaintiff's land interdicted by said ordinance is essentially and naturally an integral part of a large district properly left by said ordinance unrestricted or free for business purposes, being the factory or industrial district of the city. That district may be bounded roughly as follows:—Beginning at the Ford Assembling Plant, bounded by Brookline Street, Massachusetts Avenue and Main Street, Windsor Street, Cambridge Street in East Cambridge, the Charles River, Massachusetts Avenue at Harvard Bridge, the Grand Junction Freight Railway to the aforesaid Ford Assembling Plant, containing approximately one square mile, or about one-sixth of the city's whole area, where probably are carried on a greater number and variety of manufacturing plants and mercantile enterprises, representing a greater investment of capital, [fol. 11] employing a greater number of persons, than in

any area of its size in greater Boston outside the Boston municipality. All of said district, with minor and immaterial local exceptions, is by said ordinance placed in the unrestricted and business zone of the city, though it contains a considerable number of dwelling houses. Substantially all the rest of the city area is residential and is so zoned, except on main thoroughfares which are zoned for business.

12. With reference to the immediate surroundings of said interdicted land, Brookline Street and Bridge have become the main connecting thoroughfare between the two vast territories separated by the Charles River, viz., Brookline and towns to the southwest, and Cambridge and cities to the north and northeast. Brookline Street is a main or principal highway running from the Charles River at Brookline Street Bridge (which spans the river) a distance of 4,000 feet to Massachusetts Avenue in Cambridgeport. Over said bridge and street every day are driven both ways a great quantity of unrestricted vehicular traffic, mostly trucks and automobiles, coming from Brookline and other points going to and through Cambridge and other points, and in the opposite direction. Brookline Street itself is largely given to business and industry.

13. The said bridge having proved inadequate for the great burden which it was bearing, the Legislature, Acts 1921, Chapter 497, authorized and directed the Metropolitan District Commission to remove said bridge and erect a new bridge at Brookline Street at a cost not exceeding $700,000, without draws and with suitable approaches. The old bridge has been removed, a temporary bridge is now in use, and a new bridge is in process of construction. The completion of the new bridge will inevitably increase the traffic on Brookline Street and necessitate a substantial widening of Brookline Street now 40 feet wide to accommodate the increased traffic and to bring the street into conformity with the width of said new bridge.

14. The said tract is bounded on the north easterly by Henry Street. Henry Street leads from and is the outlet to Brookline Street of a large area situated between the freight railroad referred to above and Brookline Street, on which are located extensive manufacturing plants and

warehouses. Every business day and all day large trucks loaded and unloaded are frequently passing over Henry Street and Brookline Street to and from these plants. A considerable quantity of said area is still vacant but inevitably before long will be used for the construction of [fol. 12] more of such plants. On the southwest of said affected tract, and contiguous to it, is a vast area of land, some portions being vacant, some occupied by mercantile establishments, which said alleged ordinance leaves wholly unrestricted, there being here a gross violation of a well-settled and sound zoning rule, viz., that an unrestricted area should not be brought into immediate juxtaposition with a resident area, but that two extreme use areas like an unrestricted area and a residence area should be separated by means of a street or an intermediate area such as a business area.

15. On the southwesterly side of said affected tract and separated from it only by a narrow and unrestricted passageway or rangeway is located the vast plant of the Ford Automobile Company, occupying 193,000 square feet, on which stands a brick factory building five stories high, with appurtenant sheds, stock buildings, and garage, having an aggregate floor area of 242,000 square feet, employing approximately 1,000 persons. In this building are received and assembled and from it delivered all Ford cars for distribution in the New England district. Large numbers of automobiles are driven every day to and from this plant, and are parked about the neighborhood by employees, customers of the Ford Company and other persons having dealings with it.

16. Not far from the said tract is the branch of the Boston and Albany Railroad, which crosses the river near Brookline Street. This is exclusively a freight railroad; it connects the Boston and Maine System with the Boston and Albany and affiliated railroads. Long trains carrying heavy freight frequently, especially at night, are passing over this railroad. The railroad has made the area through which it runs exceedingly valuable, through the freight shipment and delivery advantages it affords the industries near its tracks. It has immutably fixed the character of said area as non-residential, as is shown by the

industrial growth of the area as set forth in paragraph [?], and as is shown by the further fact, which the plaintiff alleges, that dwellings which in earlier years stood upon the land near the lot in question have been abandoned, torn down, and in their places now stand warehouses or factories. On the affected tract stands a house occupied sixty years ago by Alvan Clark, the famous instrument maker, but it has not been occupied as a dwelling for many years, and is now in ruins. Mr. Clark, as plaintiff is informed, carried on in said house, his business of making telescopes. No new dwelling house has been erected in the [fol. 13] neighborhood for a great many years, except possibly some apartment houses on Henry Street, but these by said ordinance are separated only by Henry Street from the unrestricted district on the opposite of Henry Street.

No rational person would now choose the affected tract for a single dwelling house at any price; there is plenty of land available for dwellings in other parts of the city; and the industrial activities surrounding the tract render it most unsuitable for a dwelling house. The other uses permitted by the ordinance are wholly visionary and impractical, except that possibly if the present depth of 100 feet were maintained, a multiple dwelling or tenement house might conceivably be erected of wood, to be let at a low rent, highly undesirable from every zoning point of view; but even this use is rendered impracticable by the known necessity for widening Brookline Street on that side to conform to the new bridge and by the further fact that a municipal ordinance will probably make a substantial setback for buildings, when the new street line is established.

17. The plaintiff upon learning that the city government had undertaken in the manner aforesaid to classify his said land in a residence use district, applied to the city government for an amendment to said ordinance reclassifying his said land as business or unrestricted land, but the city government refused to so amend said ordinance.

The plaintiff thereupon, under the provisions of General Laws Chapter 40, Section 27, and Acts 1924, Chapter 133, petitioned in writing the board of appeals to vary the application of said ordinance to the specific land of the plaintiff, by placing said land in a business use district, with a reasonable setback on Brookline and Henry Streets, but

said board after unanimously finding as a fact that substantially the entire value of plaintiff's land had been destroyed by the inclusion of it in a residence use district and informing plaintiff's counsel that it would not be necessary to call witnesses on that point, refused to pass a unanimous vote authorizing any variance whatever.

18. The intent and purpose of the defendant city council or government in placing plaintiff's said land in a residence district was not to regulate the use of said land in such a manner as would best promote the health, safety, convenience and welfare of the inhabitants of Cambridge or as would lessen the danger from fire, or to pay due regard to the characteristics of the part of the city in which said land is located, but the intent, purpose and effect of said [fol. 14] city council or government was under the guise of proper and constitutional zoning to take said land as a park or open place or vista for the particular benefit or profit of persons living or owning property near said affected tract, or for the supposed aesthetic purpose of providing a park or open space on plaintiff's said land.

19. The defendant city and its officials and the defendant Downey as Inspector of Buildings by their acts, conduct, and utterances have warned and threatened plaintiff that under no circumstances will he or any person be permitted to erect or use any building on said interdicted tract except under the classification aforesaid of Residence 3.

[*20. The defendant city by its inhibition aforesaid of any use of plaintiff's land aforesaid except for residences has exceeded the authority delegated by General Laws Chap. 40, Sec. 25, and has deprived and will deprive the plaintiff of rights and property guaranteed and protected by the 5th and 14th amendment to the Constitution of the United States.]

Wherefore the plaintiff prays--

1. That a mandatory injunction issue directing the defendant city and the defendant Downey as Inspector of Buildings to consider and pass upon any application of the

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*Amendment filed and allowed September 21, 1926. [Pierce, J.]

plaintiff for a permit to erect a building or buildings on the tract described in paragraph 2 as if said ordinance had not been enacted.

2. That a mandatory injunction issue directing the defendant city to permit the plaintiff to erect any lawful building upon said tract, disregarding the provisions of said alleged ordinance.

3. That said ordinance intituled and enacted in the manner set forth in paragraph 3 of this bill be adjudged and decreed to be null and void and of no effect, because of noncompliance by the city council aforesaid of conditions precedent as ordained by law.

4. That said ordinance if held to be legally enacted, be held to be invalid in its specific application to plaintiff's land described in paragraph 2, for the reasons set forth in paragraph 4 and following paragraphs.

5. For such other relief as to the Court shall seem meet and justice may require.

Saul M. Nectow.

[fol. 15] *Duly sworn to by Saul Nectow. Jurat omitted in printing.*

In Supreme Judicial Court of Massachusetts

Answer—Filed January 16, 1925

1. The Respondents admit the allegations in the first paragraph of the plaintiff's petition.

2. The Respondents neither admit nor deny the allegations in the second paragraph of the plaintiff's petition but leave the plaintiff to prove the same if material, except that the Respondent admit that, since the first Monday in January, 1916, the city of Cambridge has been governed under the provisions of Plan B, Chapter 267 of the Acts of 1915, now General Laws, Chapter 43.

3. The Respondents admit that the ordinance in question was adopted by the City Council as set forth in the third paragraph of the plaintiff's petition; that said ordinance

exceeded in length eight octavo pages of ordinary book print; that in lieu of publishing the proposed ordinance once in full in one newspaper of the city at least ten days before its final passage, the proposed ordinance was published in pamphlet form under the provisions of Section 23 of Chapter 43 of the General Laws.

4. The Respondents admit that the City Clerk caused five hundred copies or pamphlets of the texts of said proposed ordinance to be printed and placed on the counter in his office for distribution to the public, and the Respondents say that notice of the passage of said ordinance and that copies thereof would be at the City Clerk's office for distribution upon and after December 19, 1923 was duly published in four newspapers published in Cambridge on December 13, 1924, which publication was as follows:

[fol. 16] (First Publication Number 568)

[SEAL.]

City of Cambridge, Massachusetts

Zoning Ordinance

Public Notice

In the Year One Thousand Nine Hundred and Twenty-three

An ordinance in amendment to an ordinance entitled "Construction, maintenance and inspection of buildings", amending the present building code by incorporating therein the Zoning Ordinance, was passed to a second reading at a meeting [of] the City Council held on December 11, 1923, and after December 29, 1923, the question may be on passing to be ordained.

Attest:— Frederick H. Burke, City Clerk.

NOTE.—Pursuant to the provisions of Section 23 of the City Charter, the ordinance as aforesaid in pamphlet form will be ready for distribution at the office of the City Clerk of Cambridge on or after December 19, 1923.

By order of the City Council.

Frederick H. Burke, City Clerk.

And the Respondents deny that no zone map accompanied said pamphlet. And the Respondents say that there was on file in the office of the City Clerk a large map which accompanied the original text of said proposed ordinance which was acted upon by the City Council, which large map was on file in the office of the City Clerk and open to public inspection, and that with each copy of the proposed ordinance which was in the office of the City Clerk for public distribution there was a small map, a replica of the aforesaid original large map, which said maps showed clearly [fol. 17] and plainly in which district and zone each and every parcel of land in the city lay including the land of the petitioner. The Respondents deny that said ordinance was not published in accordance with law but say that publication of said ordinance as required by law was duly complied with.

5. The Respondents have no knowledge of what information the petitioner may have received as to the passage of this ordinance except as has been set forth and leave the plaintiff to prove the same if material. And the Respondents deny that it is impossible to interpret the division of the city into zones or district from the ordinance and the map accompanying it without reference to any further document.

6. The Respondents admit that said ordinance has never been approved by the Attorney General.

7. The Respondents admit that the tract of land in question, mentioned in the first paragraph of the plaintiff's petition, is in a residence district so called and its use limited to residence of the third class. The Respondents deny that said enactment is invalid and say that said ordinance has been passed in accordance with law. And the Respondents admit that said ordinance has not been approved by the Attorney General and that approval of said ordinance by the Attorney General is not requisite to its validity. The Respondents admit that the defendant city and its inspector of buildings are assuming and undertaking to enforce said ordinance and have refused to grant to the plaintiff a permit to erect a building, the erection of which would be unlawful under the provisions of said ordinance. The Respondents deny, if material, that said land

is wholly unsuitable for dwelling and is fit only for business or mercantile buildings; that the enforcement of said ordinance is causing substantial damage to the plaintiff or that the threat to enforce said ordinance against said tract has made it unsalable.

8. As to the allegations set forth in the eighth paragraph of the plaintiff's petition, the Respondents have no knowledge and neither admit nor deny the same, but leave the plaintiff to prove the same if material.

9. The Respondents admit the allegations in the ninth paragraph of the plaintiff's petition.

10. The Respondents deny that said ordinance in its application did not carry out the provisions of General Laws, Chapter 40, Section 25, but say that said ordinance is in conformance with said statute.

11. The Respondents neither admit nor deny the allega-[fol. 18] tions in the eleventh paragraph of the plaintiff's petition and require the plaintiff to prove the same if material.

12. The Respondents neither admit nor deny the allegations in the twelfth paragraph of the plaintiff's petition and require the plaintiff to prove the same if material.

13. The Respondents neither admit nor deny the allegations in the thirteenth paragraph of the plaintiff's petition and require the plaintiff to prove the same if material.

14. The Respondents neither admit nor deny the allegations in the fourteenth paragraph of the plaintiff's petition and require[s] the plaintiff to prove the same if material.

15. The Respondents neither admit nor deny the allegations in the fifteenth paragraph of the plaintiff's petition and require the plaintiff to prove the same if material.

16. The Respondents deny the allegations in the sixteenth paragraph of the plaintiff's petition.

17. The Respondents neither admit nor deny the allegations in the seventeenth paragraph of the plaintiff's petition and require[s] the plaintiff to prove the same if material.

18. The Respondents deny the allegations in the eighteenth paragraph of the plaintiff's petition.

19. The Respondents deny the allegations in the nineteenth paragraph of the plaintiff's petition.

[*20. The respondents deny that the plaintiff's land has been restricted for any use except for residences, and the respondents deny that, in the zoning of said plaintiff's land, the city has exceeded the authority delegated by General Laws, Chapter 40, Section 25, and the respondents deny that said zoning of the plaintiff's land has or will deprive the plaintiff of rights and property guaranteed and protested by the 5th and 14th amendment to the Constitution of the United States.]

Wherefore the Respondents pray that said petition may be dismissed.

By Their Attorney, Peter J. Nelligan.

[fol. 19] In Supreme Judicial Court of Massachusetts

Report of Master—Filed July 20, 1926

Pursuant to the rule to me directed I have heard the parties and their evidence and make the following findings of fact and report the same to the Court.

Prayers in the Bill

This is a bill filed the 31st day of December, 1924, for a mandatory injunction to direct the defendant, City, and its Inspector of Buildings, to consider and pass upon an application of the plaintiff for a permit to erect a building or buildings on the tract of land situate at the corner of Brookline and Henry Streets, in Cambridge; also to direct the defendant, City, to allow the plaintiff to erect any lawful building upon said tract of land regardless of the provision of a certain ordinance of said City; that said ordinance be held to be invalid in its specific application to the plaintiff's land for the reasons set forth in the bill.

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*Amendment filed by leave of court October 1, 1926, as of September 21, 1926. [Pierce, J.]

Findings of Fact

1. At the request of both parties and in the presence of their counsel I took a view on two different occasions of the premises in question and of the surrounding territory before and after the introduction of the evidence for the purpose of enabling me to better understand and apply the evidence to be given and later given at the hearings and thereby to acquire a certain amount of information. The zoning ordinance herein referred to was passed by the City Council on December 31, 1923, and approved by the Mayor on January 7, 1924.

2. Since the filing of the bill and relating to the subject matter set forth in paragraphs two (2) and eight (8) thereof, the Legislature of this Commonwealth passed an Act, being Chapter 87 of the Acts of 1925, which Act is entitled and reads as follows:

[fol. 20] "An Act Validating an Ordinance of the City of Cambridge Entitled 'Construction, Use, Maintenance and Inspection of Building[s]'

"Be it enacted, etc., as follows:

"Section 1. A certain measure entitled 'Construction, Use, Maintenance and Inspection of Buildings,' passed to be ordained by the council of the city of Cambridge on December thirty-first, nineteen hundred and twenty-three and approved by the mayor of said city on January, seventh, nineteen hundred and twenty-four, is hereby validated and confirmed as an ordinance of said city if and in so far as it is invalid by reason of failure to comply with section twenty-three of chapter forty-three of the General Laws requiring publication thereof in full.

"Section 2. This act shall take effect upon its passage.

Approved March 12, 1925."

3. The plaintiff is the owner of the real estate described in the bill.

4. The defendant city is six and one-quarter miles square and over one-third of the area of the municipality is used by college and other educational institutions and churches.

5. The defendant, Downey, is and for a long time has been the Superintendent of Public Buildings and Inspector of Buildings of the defendant City. He is also clerk of the Building Department and clerk of the Board of Appeals, hereinafter referred to.

6. At the time of the enactment of the zoning ordinance by the City of Cambridge, referred to herein, and for some time prior thereto, the plaintiff was and is now the owner of a large tract of land containing one hundred forty thousand (140,000) square feet more or less, of which the locus in question is a part.

7. The locus in question contains about twenty-nine thousand (29,000) square feet and is situate on the southeasterly corner of Brookline and Henry Streets. The frontage on Brookline Street on the west is three hundred four and 75/100 (304.75) feet; on Henry Street on the north, one hundred (100) feet; on other land of the plaintiff on the east two hundred and sixty-four (264) feet, and southerly on land of the Ford Motor Company seventy-five (75) feet. The territory east and south of the locus is in zone U-4 and south of the locus and separated from it by a passageway is land of the Ford Motor Company, with its large auto assembling factory thereon. South of Brookline Street on the opposite side thereof is park land so called under the control and supervision of the Metropolitan District Com- [fol. 21] mission. This land adjoins and is part of the Cambridge River Parkway and is known as Memorial Drive.

8. Along the entire line of said Ford Motor Company land there is a strip of land about twenty-five (25) feet wide the fee in which was owned by the plaintiff and used as a passageway or Rangeway so called, as hereinbefore referred to, and subject to spur track rights of way. Said spur track is more particularly mentioned hereafter in this report. Reardon's Soap factory is close to this property, within about seven hundred and fifty (750) feet therefrom, and the tracks of the Boston and Albany Railroad are close to this property. These tracks are used almost exclusively for freight purposes, and on a spur track a large portion of the shifting is done during the night time of each day.

9. There are three zones or districts relating to the subject of this bill, viz: the unrestricted districts, business districts and residence districts, all as shown on the zone map which accompanies the ordinance and made a part thereof.

10. In Brookline Street directly opposite the locus there are located several apparently well kept single houses and they are in the same zone as the plaintiff's land. Diagonally across Brookline Street from the plaintiff's locus on the corner of Brookline and Henry Streets is a public park of the defendant City called Hastings Square. This park contains about thirty thousand (30,000) square feet of land. In Henry Street directly opposite the plaintiff's locus are single and double wooden dwelling houses in apparently good condition and they likewise are in the same zone district as the plaintiff's land. The southerly side of this house was used, about twelve (12) years prior to the ordinance aforesaid, and occupied by a watchman of the Ford factory. At the time of the ordinance said house was vacant.

11. The plaintiff's land was vacant except that there was a dilapidated and abandoned mansion house on it formerly used and occupied as a residence by one Clark, well known as an astronomical telescope maker. This house faced Brookline Street and was on the market to be sold for residential purposes, for many years. It has since been destroyed or torn down to the foundation walls. There was also a brick factory building used in making of astronomical lenses, facing Henry Street, located about two hundred and twenty-five (225) feet from Brookline Street.

12. The land of the plaintiff, at the time of the enactment of said zoning ordinance was free of all restrictions and was available for use for any and all lawful purposes. [fol. 22] This land, placed in R. 3 zone, had never been used for other purposes than for residences, as aforesaid. The remaining land of plaintiff has always been vacant except that there was one dwelling house on a certain part thereof as hereinafter described.

13. On or about August 2, 1923, the plaintiff made an agreement in writing with the Pittsburgh Plate Glass Company by the terms of which said company agreed to purchase and the plaintiff to sell by quitclaim deed, one certain

parcel of land being the tract of land, here in question, and being the parcel comprising the entire frontage in Brookline Street and running along Henry Street, two hundred twenty-one and 75 100 (221.75) feet and by the middle line of said passageway or the old Rangeway, so called, two hundred fifteen and 87 100 (215.87) feet, containing about fifty-one thousand (51,000) square feet, exclusive of the portion of said property included within the lines of said passageway appurtenant to said property. By said agreement said company was to construct and maintain a spur track from Brookline Street within the bounds of said passageway over the premises of the plaintiff to be set apart for that purpose to the tract of the Boston and Albany Railroad Company.

14. For such deed and conveyance said company was to pay the sum of sixty-three thousand (63,000) dollars within sixty (60) days from the date of the agreement. The amount of said purchase price was substantially equivalent to one and 24/100 (1.24) dollars per foot. The addition of a spur track would substantially increase the value of the remaining land.

15. The time for the performance of this agreement was extended by mutual consent of the parties thereto and said agreement, which was in force at the time of said ordinance, was never performed. The company refused to accept a deed of the land because of the zoning restrictions set forth in said ordinance.

16. For the purpose of clarity a plan of all of the plaintiff's land is annexed to this report and made a part hereof.

17. I find, if material, that the plaintiff was not a resident of the City of Cambridge at the time of the enactment of said ordinance. It appears from the bill and answer thereto that he had no knowledge of the pendency of said ordinance and did not know of it until sometime after it was enacted.

18. By the terms of said ordinance and said plan annexed, that part of the plaintiff's land fronting on Brookline Street for a distance of one hundred (100) feet back [fol. 23] from Brookline Street was placed in a residence use district and in a building district residence 3. The portion of said passageway adjoining said parcel was not

included in said residence district. In said residence use district only the following uses are allowed:

"Dwellings, hotels, clubs, churches, schools, philanthropic institutions, greenhouses and gardening, with customary incident accessory uses.

4 story of 60′ buildings (on large plots buildings other than apartment houses may if set back 100′ from every lot line have 6 stories or be 80′ feet)."

The following uses are expressly prohibited in said residence district:

"Business and industry all sorts.

Buildings of 5 or more stories or over 60′ high.

Yards and courts where provided must be somewhat larger than at present.

Buildings must be set back 5′ and be at least 25′ from the center of any street."

19. By said ordinance all the rest of the plaintiff's land including the entire passageway was placed in the district designated as "Unrestricted" and in a building district known as "Unrestricted 3".

20. Under the aforesaid ordinance the lawful uses of said land permitted are—six stories or eighty foot buildings. No use of said remaining land was prohibited; the only prohibition relates to 7 or 8 story buildings or over eighty (80) feet high while within one hundred (100) feet of a business or residence district buildings of five (5) or more stories or over sixty (60) feet are allowed.

21. If Brookline Street, now forty (40) feet wide in front of the plaintiff's land, is widened by act of the defendant City, by taking from the plaintiff's land thirty-five (35) feet fronting on Brookline Street it may be possible even then to erect tenement houses, but such widening would increase the segregation or isolation of plaintiff's R zoned lot in part from the remainder of the Residence zone, of which it is a part.

22. Seemingly it would not be financially advisable to bulid apartment houses on the tract of land in question. Ordinarily apartment houses are not built near commercial property.

23. No order for the widening of Brookline Street has been passed by the City Council of the defendant City, nor has the proposed bridge been erected, but a temporary bridge is now in use.

[fol. 24] 24. The parties have agreed and it is here reported that the entire ordinance including Section 12 and all the other essential provisions of the building ordinance proper relating to the spacing, height and material of buildings and the right of the Board of Appeals to extend unrestricted use of land may be considered and treated as if made a part of this report.

25. There is a substantial amount of vehicular traffic in Brookline Street in front of the plaintiff's land and in Henry Street also including light and heavy commercial trucks and pleasure automobiles of all kinds. This condition of use will, in all probability, continue and become greater from time to time.

26. Upon the passage of the ordinance herein set forth in the Pittsburgh Plate Glass Co. declined to accept a deed of the land described in the written agreement aforesaid, because the land had been included in R 3 use district. If lot had been zoned in a B district it would have been acceptable for the purposes of the Pittsburgh Plate Glass Co., a financially responsible corporation, and it would have been purchased by it. If the front land had been in either B or U district, the Company would have purchased the whole of the locus here in question.

27. After the passage of this ordinance, the plaintiff, applied to the defendant City Government for an amendment to the ordinance here in question for the purpose of reclassifying the plaintiff's locus as business or unrestricted land but this application was denied.

28. Thereupon the plaintiff applied to the defendant Downey as Superintendent of Buildings of the defendant City, for a permit to construct a building essentially different from that allowed by said ordinance but otherwise lawful and the defendant Downey declined to issue such a permit.

29. Thereupon the plaintiff in or about August, 1924, acting under the provisions of Chapter 40 Section 27 of the

General Laws and Chapter 133 of the Acts of 1924, petitioned the Board of Appeals to vary the application of said ordinance, so as to permit the plaintiff to erect a B3 building of a certain height on said locus, or in other words, to take said tract of land out of the residence district use. Said board of appeals after a hearing refused to pass a unanimous vote as required by law authorizing said variance. I find, if material, that only one member, however, refused to sign the decision of the Board.

[fol. 25] 30. I find, if material, that the other two members of the Board of Appeals were in favor of granting the plaintiff's application.

31. I also find, if material, that the plaintiff has not filed a petition for a writ of certiorari under the provisions of Chapter 133 of the Acts of 1924.

32. The evidence does not enable me to find, if material, as contended by the plaintiff, that the City Council of the defendant City in zoning the locus in question did so for the purpose of providing a park or other open space on the plaintiff's land.

33. The territory to the west and north of the locus is a thickly settled residential district with a small amount of land available for more residences.

34. On February 18, 1924, pursuant to the terms of an agreement of sale, the plaintiff sold to Haskell-Adams Company from his said large tract of land shown on plan hereinbefore mentioned of about twenty-four thousand (24,000) square feet for the sum of thirty thousand (30,000) dollars. This area is located about three hundred and seventy (370) feet from Brookline Street. On this land so purchased said company has erected a reinforced concrete warehouse two stories high with basement covering a floor area of sixty thousand (60,000) square feet at an expense of two hundred and thirty thousand (230,000) dollars, including equipment or fixtures. This concern is in the wholesale grocery business and employs about seventy-five workmen and is using said building for roasting coffee and "small packaging" and as its New England centre for the distributing of its goods. A dwelling house which formerly stood on this tract of land was torn down to make way for the Haskell-Adams Company building.

35. The Legislature by Chapter 497 of the Acts of 1921, directed the Metropolitan District Commission to remove the existing Brookline Street Bridge so called and construct a new bridge with suitable approaches at or near the present site and provision was made for a loan not to exceed seven hundred and fifty thousand (750,000) dollars to erect said bridge. The erection of this proposed bridge would, in my opinion, require probably a substantial widening of Brookline Street on the side of the plaintiff's land.

36. I find, if material, that prior to the enactment of said ordinance the following matters were before the City Council of the defendant City: See entire Chapter 477 of the Acts of 1921.

36A. The mayor of the defendant City officially declared that "the new bridge implies" the widening of Brookline [fol. 26] Street "to match the bridge and such view seems to be one of general recognition by persons in the position to know the territory in and about Brookline Street." This evidence as to the declaration of the mayor was admitted subject to the defendants' objection.

36B. On April 23, 1923, the mayor caused a plan to be prepared showing the proposed widening of Brookline Street and this plan and a letter were submitted to the City Council and on June 19, 1923, the council requested the mayor to recommend an appropriation sufficient to cover the cost of widening Brookline Street between Henry and Granite Streets. This plan showed that the proposed widening was on the plaintiff's land. The evidence relative to the above was objected to by the defendants.

36C. On November 27, 1923, the City Council referred to the mayor an order relating to widening Brookline Street between said streets and on June 29, 1925, said council appropriated thirty-three thousand two hundred (33,200) dollars for the widening of Brookline Street to the extent of seventyfive (75) feet. This order and appropriation were approved by the mayor. The evidence relative to the above was objected to by the defendants.

37. If Brookline Street is widened to the extent of seventy-five (75) feet on the side of the plaintiff's land, such widening will necessarily reduce the amount of the plaintiff's land in R. 3 district to sixty-five (65) feet in depth.

38. Adjoining the plaintiff's land on the south is the assembling factory of the Ford Motor Company, heretofore referred to, which plant has an area of two hundred forty-three thousand (243,000) square feet and employs about five hundred seventy-five (575) men in the assembling of Ford parts and in the production of about two hundred (200) completed automobiles a day. The parts come from Michigan by freight and about one hundred and fifty (150) cars on an average are built each working day. Cars are shipped by freight to all parts of New England and some automobiles are driven away. There are about thirty-five (35) to forty (40) freight cars used each day to ship the completed Ford vehicles, so that in all about two hundred and fifty (250) cars leave the factory every day. A spur track runs through the Ford building from the Grand Junction Branch of the Boston & Albany Railroad Company heretofore and hereinafter mentioned. Assembling is done on all floors of this six story factory and sometimes at night. [fol. 27] The work done there on the top floor of the factory, in the body department, is noisy. The land of the Ford factory is use districted as "U. 2".

39. On the East is the unrestricted land of the plaintiff and the building of Haskell-Adams Company heretofore mentioned. In a Northeast direction is the Grand Junction Branch of the Boston & Albany Railroad Company, which branch connects the trains at the East Boston Steamship docks with the main line at Cottage Farm and is exclusively a freight line. It passes the plaintiff's residence districted land here in question within six hundred (600) feet. There are about two hundred (200) spur tracks connecting various industrial plants with this railroad within the area covered by the Grand Junction Railroad (see Zone plan) and these spur tracks and the railroad serve a substantial manufacturing district which lies to the East and Northeast of the plaintiff's land. The spur track or siding of Haskell-Adams Company is within two hundred and twenty (220) feet of Brookline Street. Trains pass by and railroad cars are shifted both day and night. All of this district is districted as "U. 1" and "U. 2" by the ordinance and is especially adapted for mercantile and industrial purposes. The plaintiff's land is close to this business area as heretofore described and it is difficult if not impossible to differentiate the material and dominant characteristics of the Ford

property and the plaintiff's other land adjoining on the East from those of the plaintiff's land in question.

40. This land was to be sold to the Pittsburg Plate Glass Company for about one dollar and fifty cents ($1.50) per square foot as heretofore stated. There is a greater demand for this land for business purposes, including manufacturing, than for dwelling houses. No dwelling house has been erected in the immediate vicinity of the plaintiff's land within the last twenty or twenty-five years, except that an apartment house was erected in Brookline Street about six hundred (600) feet from the plaintiff's land about fifteen years before the enactment of the ordinance. There is, however, a small area of land available for dwelling houses, as heretofore set forth. To the north and west of the plaintiff's land are Henry and Brookline Streets respectively, and these streets are used for all kinds of vehicular traffic which is increasing. Trucking to the unrestricted district comes over both streets to and from Boston, across the bridge.

41. Separated by Brookline Street from the plaintiff's lot and from the unrestricted district and the Ford fac- [fol. 28] tory, is a district lying towards the West and North, covering a large area and used almost exclusively for residential purposes and included by the ordinance in use District "R. 3".

42. The average value of land used for residences in the vicinity of the plaintiff's land is twenty (20) cents per square foot exclusive of the value of buildings thereon. Some of the dwelling houses were formerly used and occupied by the owners thereof as single residences, but are now occupied by two families. There are some single residences occupied by the owner but most of the houses are two story multiple apartment houses. At the time of the views taken by the master, there were no school children apparently living in Brookline Street in the immediate vicinity of the plaintiff's land and there is no school nearby. One residence is about one hundred (100) feet from the Ford factory.

43. Separated by Henry Street from the plaintiff's land are four dwelling houses. One is on the corner of Brookline Street and is a single house used and occupied by the

owner, whose place of business is about six hundred (600) feet away in the unrestricted district in Henry Street. The other three are three apartment houses used and occupied by tenants. The apartment houses are located opposite the unrestricted portion of the plaintiff's land. I find that the erection of a first class mercantile building on the plaintiff's land, such as would be required in Use U districts, would not substantially increase the fire hazard of the residential neighborhood. The insurance rates for dwelling houses would be substantially greater than for first class mercantile buildings in this district.

44. Both sides of Brookline Street, for a distance of about five hundred (500) feet from Henry Street north are zoned for "Residence 3". Beginning about one hundred (100) feet south of Putnam Avenue and running for about one mile, Brookline Street is zoned for business 3, including said apartment house heretofore referred to as the last dwelling house erected in the neighborhood.

45. The line of the Residence 3 district is carried from the rear of the plaintiff's R. 3 land along Henry Street about three hundred (300) feet to Sidney Street and along Sidney Street for about one thousand (1,000) feet and then turns to come with the "B 3" line of Brookline Street.

46. The land in both sides of Sidney Street is an unrestricted district.

47. It appears that under the ordinance referred to, the [fol. 29] owner of the rear lots is entitled to erect an unrestricted building up to the line of the zoned area and by permission of a majority of the Board of Appeals to build twenty-five (25) feet beyond as an extension of his "U" land. If and when Brookline Street is widened, the plaintiff's lot will be sixty-five (65) to eighty (80) feet deep and in all probability no single residence will be built there and no four story dwelling houses can be erected there (see Section 17 of zoning law, "Building Code").

48. I am satisfied and I find as a fact that no practical use can be made of the land in question for residential purposes, because among other reasons herein related, there would not be adequate return on the amount of any investment for the development of the property.

49. From Reardon's soap factory heretofore mentioned, located within about seven hundred and fifty (750) feet of the plaintiff's land, there come bad odors, when the wind blows from the Southeast.

50. It was stated in behalf of the defendants by one of their witnesses at the hearings held by me that the plaintiff's property should be divided into five lots and that on four from the bridge three story building might be erected, leaving one vacant lot, each building to contain six four-room and bath apartments; that each tenant pay fifty (50) dollars per month rent and furnish his own heat. The cost of the buildings would be about one hundred twenty thousand (120,000) dollars and for the land ten thousand (10,000) dollars and that the owner be relieved of paying cimmissions and building loan interest and that he collect the rents and oversee the property himself.

51. In the light of all the facts and in view of all the attending circumstances, and considering the territory and its expected development, and the size of the locus, I find that such a project or proposition would not be practical or feasible.

52. The district where the plaintiff's locus is situate is easily accessible to Boston by way of Massachusetts Avenue, the Cambridge Tunnel or by way of the Commonwealth Avenue route.

53. The vacant land in question as zoned as aforesaid is worth about eight thousand (8,000) dollars. The land in the defendant City available for business or unrestricted purposes exceeds the area of land useful for residential purposes. The land in the defendant city available for business or unrestricted purposes exceeds the area of vacent land useful for residential purposes, but according to the zoning map the area of the city districted for unrestricted uses [fols. 30-32c] is much less than the area used and districted for residence purposes.

54. The changing of the locus in question from a residential to a business district would tend to increase to a small extent, the amount of commercial traffic in Brookline Street.

55. I make no finding or ruling as to whether or not the plaintiff has under said contract, an adequate remedy against said corporation for damages suffered, if any, by reason of the locus being placed in R3 zone.

56. I have already referred to the fact that on two sides of the plaintiff's land there are dwelling houses separated therefrom by streets while on the other sides there are industrial plants hereinbefore specifically referred to, not so separated.

57. I am satisfied that the districting of the plaintiff's land in a residence district would not promote the health, safety, convenience and general welfare of the inhabitants of that part of the defendant City, taking into account the natural development thereof and the character of the district and the resulting benefit to accrue to the whole City and I so find.

58. At the close of the hearings the plaintiff and the defendants presented numerous requests for findings of fact; the subject matter to which these requests related have been dealt with in this report and it seems unnecessary to deal with each request specifically.

Having prepared a draft copy of this report I notified counsel for all parties of the time and place when and where they might attend to hear the same, and suggest such alterations, if any, as they might think proper. And upon further consideration thereof, I finally settled the draft of this report, as it now stands, and gave notice thereof to said counsel. And I also furnished them each with a copy thereof at their request. And I allowed five days to elapse from the time of said last hearing within which written objections might be brought in. And counsel for the defendants brought in written objections within said five days, which are appended hereto and made a part hereof.

Respectfully submitted, Wm. J. Drew, Master.

[fol. 33] In Supreme Judicial Court of Massachusetts

[Title omitted]

Rescript—Filed July 8, 1927

Ordered, that the clerk of said court in said county make the following entry under said case in the docket of said court; viz., Bill dismissed.

By the Court.

Walter F. Frederick, Clerk.

July 1, 1927.

Brief Statement of the Grounds and Reasons of the Decision

The reasons of the decision are set forth at length in the opinion, filed with the Reporter of Decisions, to which reference is made.

[fol. 33½] [File endorsement omitted.]

[fols. 34 & 35] In Supreme Judicial Court of Massachusetts

[Title omitted]

Final Degree—July 20, 1927

This case came on to be heard upon Rescript from the Supreme Judicial Court, and thereupon upon consideration thereof, it is ordered, adjudged and decreed that the bill be dismissed.

By the Court.

Joseph Riley, Asst. Clerk.

July 20, 1927.

RUGG, C.J. This is a suit in equity whereby the plaintiff seeks relief from the terms of a zoning ordinance as to certain of his land. It is not now questioned that the ordinance is valid so far as concerns the formalities of its adoption. See St. 1925, c. 87. The plaintiff at times here material was the owner of a tract of land in Cambridge containing about one hundred forty thousand square feet. It was situated on the southeasterly corner of Brookline Street and Henry Street. Its frontage on Brookline Street, a main avenue of travel, was about three hundred and five feet, and on Henry Street about seven hundred and fifty feet. It was somewhat irregular in shape, narrowing toward the rear or easterly end, where it was bounded by the Grand Junction Branch of the Boston and Albany Railroad. Along the southerly side, being about eight hundred feet in length, is a twenty-five-foot passageway designed for a spur track from the Grand Junction Branch. By the zoning ordinance the land here in question and hereafter called the locus, being that part of the larger tract directly on the corner of Brookline Street and Henry Street and containing about twenty-nine thousand square feet, was placed in the district designated as a "residence use district" and in a building district

described as "R 3," while the remainder of the tract, containing approximately one hundred eleven thousand square feet and including the entire passageway, was placed in the district designated "unrestricted" and in a building district described as "U 3." The locus, thus placed in a residence use district, has a frontage of about three hundred and five feet on Brookline Street, its westerly boundary, one hundred feet on Henry Street, its northerly boundary, and bounds easterly on the remainder of the tract about two hundred and sixty-four feet, and southerly on land of the Ford Motor Company about seventy-five feet.

The plaintiff's entire tract of land was vacant except that upon the part placed in the unrestricted district were a brick factory building and a dwelling house, since torn down to make way for a concrete warehouse erected subsequent to the passage of the ordinance. On the part restricted to residential uses, there was a dilapidated and abandoned mansion house formerly occupied as a residence by one Clark, the well known maker of astronomical telescopes. That house faced on Brookline Street and was for sale for many years for residential purposes. It has since been destroyed or taken down.

The land of the plaintiff at the time of the enactment of the zoning ordinance was free of all restrictions and available for every valuable use. The locus placed in the R 3 zone has never been used for any other than residential purposes. The remainder of the tract has always been vacant except for the dwelling house and factory to which reference has been made. The locus, by being in a residence use district under the zoning ordinance, may be used only for "dwellings, hotels, clubs, churches, schools, philanthropic institutions, greenhouses and gardening, with customary incident accessory uses," and the following uses are expressly prohibited: "Business and industry of all sorts. Buildings of 5 or more stories or over 60′ high. Yards and courts where provided must be somewhat larger than at present. Buildings must be set back 5′ and be at least 25′ from the center of any street." It has been assumed in the argument that as a practical matter there are no restrictions

imposed by the zoning ordinance upon the remainder of the plaintiff's tract of land.

The contention of the plaintiff is that the zoning ordinance as to the locus is unreasonable, an indefensible invasion of his rights, deprives him of the equal protection of the laws, and takes his property without due process of law.

The facts bearing upon these contentions are set forth in the master's report. There are three districts established by the zoning ordinance so far as here material, namely, unrestricted districts, business districts, and residence districts.

The surroundings of the locus as disclosed by the master's report are that directly opposite on Brookline Street are located several well kept single houses, and directly opposite on Henry Street are single and double wooden dwellings, all in good condition and well kept and all in the same residential district as the locus. Diagonally across Brookline Street from the locus and on the corner of Henry Street is a public park called Hastings Square. Adjoining the plaintiff's land on the south is the assembling factory, six stories in height, of a motor car company. Its plant occupies a large area. About five hundred and seventy-five men are there employed. Many automobiles are produced, most of which are shipped by freight and some are driven away. A part of the work done in this factory is noisy, and it is sometimes run at night. The Grand Junction Branch passes within six hundred feet of the locus. East and northeast of the plaintiff's land lies a substantial manufacturing district. The plaintiff's land is close to the business area and it is difficult if not impossible to differentiate the material and dominant characteristics of the automobile factory and the plaintiff's other adjoining land from those of the locus.

Shortly before the passage of the ordinance, the plaintiff had made a contract with a business company for the sale of about fifty-one thousand square feet of land, including the locus, at substantially $1.24 per foot. After the passage of the ordinance, this company refused to accept the deed because of the zoning restrictions therein contained. Shortly after the passage of the ordinance, the plaintiff sold to a company engaged in the wholesale grocery business about

twenty-four thousand square feet of his remaining large tract of land for $30,000. On this land has been erected a concrete warehouse two stories in height. This is located about three hundred and seventy feet from Brookline Street. Within about seven hundred and fifty feet of the locus is a soap factory, from which emanate bad odors. There is a greater demand for the locus for business purposes, including manufacturing, than for dwelling houses. No dwelling house has been erected in its immediate vicinity within the last twenty years, except one apartment house. Separated by Brookline Street from the locus is a district lying west and north covering a large area used almost exclusively for residential purposes and included by the ordinance in residential districts. The locus as zoned is worth about $8,000.

Specific findings of the master are: "Seemingly, it would not be financially advisable to build apartment houses on the locus." "The erection of a first class mercantile building on the plaintiff's land, such as would be required for use in U district, would not substantially increase the fire hazard of the residential neighborhood. The insurance rates for dwelling houses would be substantially greater than for first class mercantile buildings in that district." "I am satisfied and I find as a fact that no practical use can be made of the land in question for residential purposes, because among other reasons herein related, there would not be adequate return of the amount of any investment for the development of the property." "I am satisfied that the districting of the plaintiff's land in a residential district would not promote the health, safety, convenience and general welfare of the inhabitants of that part of the defendant city, taking into account the natural development thereof and the character of the district and the resulting benefit to accrue to the whole city and I so find." Allegations in the bill, to the effect that the city council of the defendant, in zoning the locus in the residence district, did so for the purpose of providing a park or other open space on the plaintiff's land, are found by the master not to be supported.

In November, 1923, the city council of the defendant city referred to the mayor an order relating to widening Brookline Street adjacent to the locus and in June, 1925, an appropriation for such widening to seventy-five feet was adopted and approved by the mayor. If such widening takes place, the depth of the locus on Brookline Street will be reduced to sixty-five feet. We interpret this and other findings in this connection to mean that, while there has been discussion as to this widening, no final action to that end has been taken by the public officers.

After the passage of the ordinance, the plaintiff applied to the city government for an amendment to the zoning ordinance so as to reclassify the locus as business or unrestricted land. This application was denied. Thereafter, he applied to the superintendent of buildings of the defendant city for a permit to construct a building essentially different from any allowed by the ordinance but otherwise lawful. He declined to issue such permit and thereupon the plaintiff, pursuant to G. L. c. 40, § 27, and St. 1924, c. 133, petitioned the board of appeals to vary the application of the ordinance so as to permit the plaintiff to erect a business building on the locus. This was refused. Thereupon the present suit was brought.

The validity in general of zoning legislation segregating within defined areas designated classes of manufacturing and mercantile business, establishing residential districts and excluding therefrom even retail stores, shops or other kinds of business, has been sustained against attack on constitutional grounds. *Opinion of the Justices*, 234 Mass. 597, 607. *Inspector of Buildings of Lowell* v. *Stoklosa*, 250 Mass. 52. *Spector* v. *Building Inspector of Milton*, 250 Mass. 63. *Brett* v. *Building Commissioner of Brookline*, 250 Mass. 73. *Euclid* v. *Ambler Realty Co.* 272 U. S. 365. The plaintiff of course accepts and is bound by these authorities. He does not assail the Cambridge zoning ordinance as a whole, unless and so far as he seeks to have it set aside in its effect in placing the locus in the residential district. His contention is that the particular zoning here in question has no support in the presence of any of the elements or combination of elements on which a valid exercise of the police power

can be put forward for zoning purposes, and hence is unreasonable in its operation as to the locus and destroys rights secured to him both by the Constitution of this Commonwealth and by the Fourteenth Amendment to the Federal Constitution. The findings of the master already summarized eliminate some of the factors commonly suggested as the basis for zoning.

It is manifest from the facts reported by the master and from the accompanying maps that the locus is near the border line between land most available for residential uses and land best adapted for commercial or manufacturing enterprises. It has not been urged that the land directly across Brookline Street or that across Henry Street from the locus has not been properly zoned in a residential district. Confessedly those lands are parts of large residential areas, stamped as such by established use. The locus, so far as it ever has been improved, has been devoted exclusively to residential purposes. If there is to be zoning at all, the dividing line must be drawn somewhere. There cannot be a twilight zone. If residence districts are to exist, they must be bounded. In the nature of things, the location of the precise limits of the several districts demands the exercise of judgment and sagacity. There can be no standard susceptible of mathematical exactness in its application. Opinions of the wise and good well may differ as to the place to put the separation between different districts. Seemingly, there would be great difficulty in pronouncing a scheme for zoning unreasonable and capricious because it embraced land on both sides of the same street in one district instead of making the center of the street the dividing line. When the general plan is sound, there may well be some flexibility in fixing the details to be worked out by the honest efforts of the public board. If it is thought that the locus is too narrow, there is nothing to prevent the plaintiff from adding to the depth of the locus by land from his remaining tract. No physical features of the locus stamp it as land improper for residence. Indeed, its accessibility to means of transportation, to centers of business, and to seats of learning, as well as its proximity to land given over to resi-

dence purposes, give to it many of the attributes desirable for land to be used for residence. The financial advantage of the plaintiff would be subserved by placing the locus in the unrestricted district and removing it from the residential district. But manifestly that is not a decisive test. *Norcross* v. *Board of Appeal*, 255 Mass. 177, 185. The monetary loss to the plaintiff disclosed on this record does not appear to be greater in proportion than that in *Salem* v. *Maynes*, 123 Mass. 372, *Spector* v. *Building Inspector of Milton*, 250 Mass. 63, and *Euclid* v. *Ambler Realty Co.* 272 U. S. 365. See cases reviewed in 234 Mass. at pages 608–610. Courts cannot set aside the decision of public officers in such a matter unless compelled to the conclusion that it has no foundation in reason and is a mere arbitrary or irrational exercise of power having no substantial relation to the public health, the public morals, the public safety or the public welfare in its proper sense. These considerations cannot be weighed with exactness. That they demand the placing of the boundary of a zone one hundred feet one way or the other in land having similar material features would be hard to say as matter of law. The case at bar appears to us to be distinguishable from *Dobbins* v. *Los Angeles*, 195 U. S. 223. *Buchanan* v. *Warley*, 245 U. S. 60, *Pennsylvania Coal Co.* v. *Mahon*, 260 U. S. 393, *Matter of Isenbarth* v. *Bartnett*, 206 App. Div. (N. Y.) 546, affirmed in 237 N. Y. 617, *Little Rock* v. *Pfeifer*, 169 Ark. 1027, and other cases on which the plaintiff relies.

The case at bar is close to the line. But we do not feel justified in holding that the zoning line established is whimsical and without foundation in reason. In our opinion it is not violative of the rights secured to the plaintiff by the Constitution, either of this Commonwealth or by the Fourteenth Amendment to the Constitution of the United States.

The plaintiff has argued, also, that rights secured to him by the Fifth Amendment to the Constitution of the United States have been invaded. That amendment does not govern the actions of the several States but only those of the Federal government. *Commonwealth* v. *Gedzium*, Mass.

Adv. Sh. (1927) 967, 968, and cases there collected. It has no bearing on the case at bar.

It follows from what has been said that the zoning ordinance of Cambridge, so far as shown on this record, is in conformity to the enabling statute and does not exceed its authorization. G. L. c. 40, § 25. It does not fall within the class of cases illustrated by *Goldstein* v. *Conner*, 212 Mass. 57, and *Cawley* v. *Northern Waste Co.* 239 Mass. 540, 544.

Bill dismissed.

COMMONWEALTH OF MASSACHUSETTS.

Boston, August 12, 1927.

I certify the foregoing to be a true copy of the opinion of the Supreme Judicial Court in the case of *Saul M. Nectow* v. *City of Cambridge & another*, decided on the first day of July, 1927.

ETHELBERT V. GRABILL,
Reporter of Decisions.

[fols. 44-48] IN SUPREME JUDICIAL COURT OF MASSACHUSETTS

[Title omitted]

ASSIGNMENTS OF ERROR—Filed August 4, 1927

And now comes Saul M. Nectow, petitioner and plaintiff in error, and in connection with his petition for writ of error represents that in the record and proceedings and in the rendering of the judgment and decision of the Massachusetts Supreme Judicial Court for the County of Suffolk in the above entitled case a manifest error has intervened to the prejudice of this petitioner and plaintiff in error, in that:

1. The Court erred in holding that an ordinance of the defendant in error City of Cambridge entitled "Construction, Use & Maintenance & Inspection of Buildings" passed to be ordained by the City Council of said City of Cambridge on December 31, 1923, signed by the Mayor of said City on January 7, 1924, promulgated under and by virtue of the Massachusetts General Laws, Chapter 40, Section 25, was in its specific application to the property of the plaintiff constitutional and would not deprive the plaintiff of his property without due process of law in violation of the 14th amendment of the Constitution of the United States of America.

[fol. 49] 2. The Court erred in holding that an ordinance of the defendant in error City of Cambridge entitled "Construction, Use & Maintenance & Inspection of Buildings" passed to be ordained by the City Council of said City of Cambridge on December 31, 1923, signed by the Mayor of said City on January 7, 1924, promulgated under and by virtue of the Massachusetts General Laws, Chapter 40, Section 25, was in its specific application to the property of the plaintiff constitutional and would not deny to the plaintiff equal protection of the laws in violation of the 14th amendment of the Constitution of the United States of America.

3. The Court erred in holding that an ordinance of the defendant in error City of Cambridge entitled "Construc-

tion, Use & Maintenance & Inspection of Buildings" passed to be ordained by the City Council of said City of Cambridge on December 31, 1923, signed by the Mayor of said City on January 7, 1924, promulgated under and by virtue of the Massachusetts General Laws, Chapter 40, Section 25, was in its specific application to the property of the plaintiff constitutional and would not deprive the plaintiff of his property without just compensation therefor in violation of the 14th amendment of the Constitution of the United States of America.

4. The Court erred in refusing to hold that insofar as the ordinance of the City of Cambridge referred to above affected the plaintiff's land the ordinance should be held to be ineffective and that the co-defendant, City Inspector of Buildings, be authorized and required to issue permits for [fols. 50-53] lawful buildings upon said land disregarding the provisions of the said ordinance.

Wherefore your petitioner and plaintiff in error prays that the said decree of the Massachusetts Supreme Judicial Court for the County of Suffolk be reversed and the said ordinance of the City of Cambridge entitled "Construction, Use & Maintenance & Inspection of Buildings" passed to be ordained by the City Council of said City of Cambridge on December 31, 1923, signed by the Mayor of said City on January 7, 1924, promulgated under and by virtue of the Massachusetts General Laws, Chapter 40, Section 25, insofar as it specifically applies to the plaintiff's property as described in his Bill of Complaint be held unconstitutional.

Dated at Boston, the 21st day of July, 1927.

John E. Hannigan, Myer L. Orlov, Attorneys for
Saul M. Neetow, Petitioner and Plaintiff in Error.

[fol. 54] In Supreme Court of the United States

Statement of the Points to be Relied Upon—Filed October 21, 1927

The plaintiff relies on the following points:

I. The Zoning Ordinance in question is in its specific application to the property of the Plaintiff in Error unconstitutional in that

(a) It deprives the plaintiff of his property without due process of law;

(b) It denies to the plaintiff equal protection of the laws;

(c) It deprives the plaintiff of his property without just compensation therefor;

all in violation of the 14th Amendment to the Constitution of the United States of America.

II. That the plaintiff's land zoned as R 3,

(a) Is unsuitable and worthless for residences and must so remain;

(b) Is not the same as the residence district in which it is zoned;

(c) Is segregated from and forms no rational part of a residence district;

(d) Is suitable and valuable only for business or industry, for which it is in demand;

[fols. 55 & 56] (e) Is of the same character as the adjacent unrestricted district; and

(f) Is reduced in value from over $40,000. to a mere speculative $8,000.

III. That the trend of development of the district of which the land in question forms an integral part is definitely industrial and has been recognized as such by the Cambridge City Council, (the City's legislative body)

(a) By the zoning of the adjacent surrounding lands as unrestricted;

(b) By the recognized necessity for and the construction (now almost finished) of a bridge at the end of Brookline Street within 400 feet of the plaintiff's land, connecting two important sections of Metropolitan Boston and affording increased facilities for the already heavy commercial traffic up Brookline Street; and

(c) By the recognized necessity for the widening of Brookline Street and by the actual taking of a substantial part of the plaintiff's land for that widening.

IV. That the public health, safety, convenience or welfare is not promoted, and the public interest is not in this instance served, by the ordinance in its specific application to the plaintiff's land.

V. That the City Council in zoning the plaintiff's land was actuated by the motive or motives of providing an open space or park and / or as one step in destroying the value of the plaintiff's property with a view to its ultimate taking for street purposes.

John E. Hannigan, Myer L. Orlov, Attorneys for Plaintiff in Error.

[fols. 57 & 58] In Supreme Court of the United States

Stipulation as to Printing Record—Filed September 3, 1927

And now comes the Plaintiff in Error and the Defendants in Error and designate the following portions of the record to be printed: (This designation need not be printed.)

Writ of Error.
Bill of Complaint.
Respondents' Answer.
Report of Master.
Rescript.
Opinion of Full Court (already printed, to be furnished by the Plaintiff in Error).
Assignment of Error.

John E. Hannigan, Myer L. Orlov, Attorneys for Saul M. Nectow, Plaintiff in Error. Peter J. Nelligan, J. Edward Nally, Attorneys for City of Cambridge and Inspector of Buildings of the City of Cambridge, Jeremiah F. Downey, Defendants in Error.

[fol. 59] [File endorsement omitted.]

[fols. 60-64] In Supreme Court of the United States

Stipulation as to Printing Record—Filed September 3, 1927

It is hereby stipulated and agreed that the Clerk of the Court shall not print the exhibit contained in the record and entitled "Zoning Ordinance of the City of Cambridge"

as a part of the record, but that in lieu thereof nine printed copies of the exhibit shall be furnished the Clerk of Court by counsel and one copy thereof shall be handed to each of the Justices at the hearing of the case and that the same shall be considered just as though it were printed with the record.

John E. Hannigan, Myer L. Orlov, Attorneys for Saul M. Nectow, Plaintiff in Error. Peter J. Nelligan, J. Edward Nally, Attorneys for City of Cambridge and inspector of Buildings for the City of Cambridge, Jeremiah F. Downey, Defendants in Error.

Endorsed on cover: File No. 32,961. Massachusetts Supreme Judicial Court. Term No. 509. Saul M. Nectow, plaintiff in error, vs. City of Cambridge and inspector of buildings of the city of Cambridge, Jeremiah F. Downey. Filed September 3d, 1927. File No. 32,961.

M. MACTOM, Plaintiff in Error,
CITY OF CAMBRIDGE ET AL, Defend-
ts in Error, No. 509, October
Term, 1927.

exhibit is part of the record
the above entitled case and ap-
ars in the certified record as
ected at pages
is omitted from the printed re-
which will be before the Court
the hearing of the case.

Hannigan
Mayo & Oliver
neys for Plaintiff in Error.

Peter J. Tulman
J. Edward Nally
neys for Defendants in Error.

City of Cambridge

Massachusetts

ZONING LAW

AND

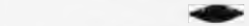
BUILDING CODE

GOVERNING

THE CONSTRUCTION, ALTERATION, REMOVAL, EQUIPMENT, OCCUPATION, AND TEARING DOWN OF BUILDINGS, STRUCTURES OR OBSERVATION STANDS AND FOR THE PLUMBING AND GAS FITTING THEREIN, AND FOR THE SETTING AND MAINTENANCE OF STEAM BOILERS AND FURNACES AND THE INSTALLATION AND ALTERATION OF ELEVATORS

1924

BUCKLEY & NICHOLSON



32 ESSEX ST., CAMBRIDGE

MAIN FEATURES OF ZONING ORDINANCE

The zoning ordinance, with certain precise exceptions designed to prevent hardship or unreasonable severity, protects specific districts of the city from unsuitable new buildings or uses. No existing uses are stopped but any changes must be towards conformity. It will be enforced as part of the Building Code. Amendments may be made by the Council, but in case of protest will require a three-fourths vote. Further relief is provided by Chapter 133, Acts of the Year 1924, which is as follows:

[CHAP. 133.]

AN ACT RELATIVE TO APPEALS UNDER ORDINANCES OR BY-LAWS LIMITING BUILDINGS TO SPECIFIED ZONES OR DISTRICTS.

Be it enacted, etc., as follows:

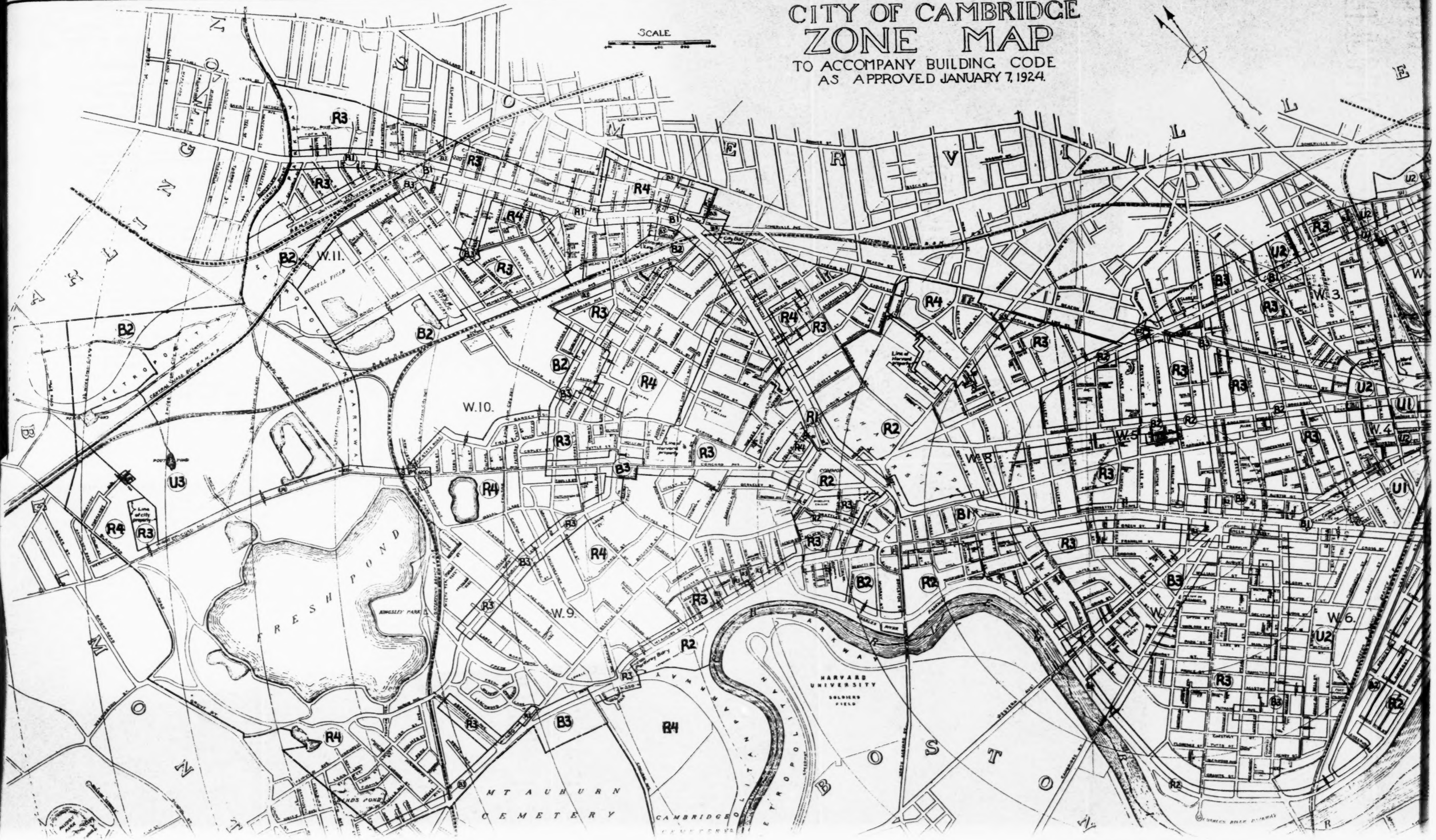
Chapter forty of the General Laws is hereby amended by inserting after section twenty-seven the following new section:—

Section 27A. A board of appeals designated or appointed under the preceding section may vary the application of any by-law or ordinance adopted under section twenty-five in specific cases wherein its enforcement would involve practical difficulty or unnecessary hardship and wherein desirable relief may be granted without substantially derogating from the intent and purpose of such by-law or ordinance, but not otherwise. No such variance shall be authorized except by the unanimous decision of the entire membership of the board, rendered upon a written petition addressed to the board and after a public hearing thereon, of which notice shall be mailed to the petitioner and to the owners of all property deemed by the board to be affected thereby as they appear on the most recent local tax list and also advertised in a newspaper published in the city or town. The board shall cause to be made a detailed record of all its proceedings relative to such petition, which record shall set forth the reasons for its decision, the vote of each member participating therein, and the absence of a mem-

ber or his failure to vote. Such record, immediately following the board's final decision, shall be filed in the office of the city or town clerk and shall be open to public inspection, and notice of such decision shall be mailed forthwith to each party in interest as aforesaid. Any person aggrieved by a decision of the board of appeals, whether previously a party to the proceeding or not, or any municipal officer or board, may, within fifteen days after the entry of such decision, bring a petition in the supreme judicial court for a writ of certiorari to correct errors of law therein, and the provisions of section four of chapter two hundred and forty-nine shall, except as herein provided, apply to said petition. No costs shall be allowed against the board unless the court finds that it acted with gross negligence or in bad faith. *Approved March 24, 1924.* Effective June 24, 1924.

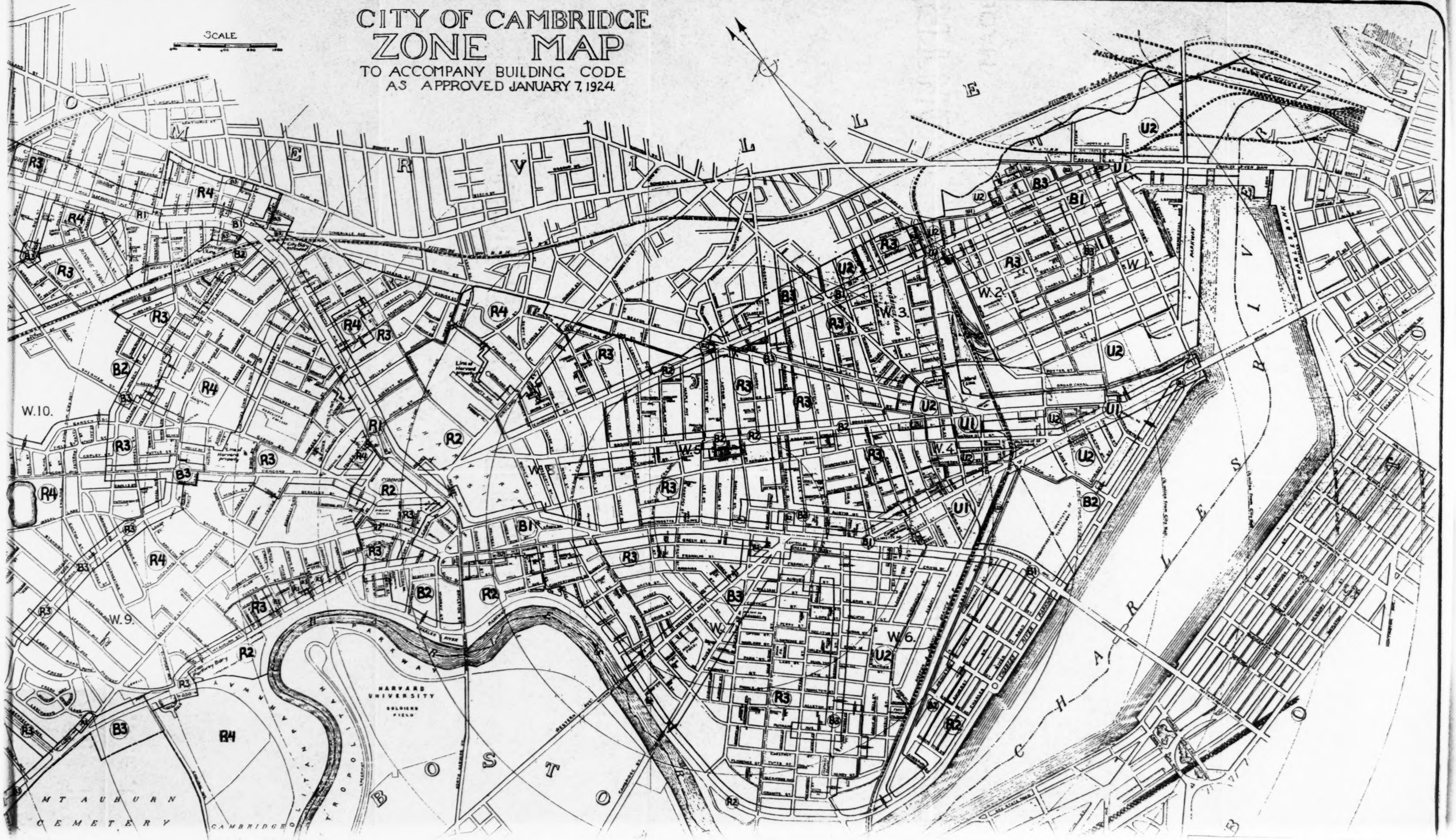
CITY OF CAMBRIDGE
ZONE MAP
TO ACCOMPANY BUILDING CODE
AS APPROVED JANUARY 7, 1924.

SCALE



CITY OF CAMBRIDGE
ZONE MAP
TO ACCOMPANY BUILDING CODE
AS APPROVED JANUARY 7, 1924.

SCALE



CEMETERY
CAMBRIDGE
CEMETERY
METROPOLITAN
W A T E R T O W N
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V E
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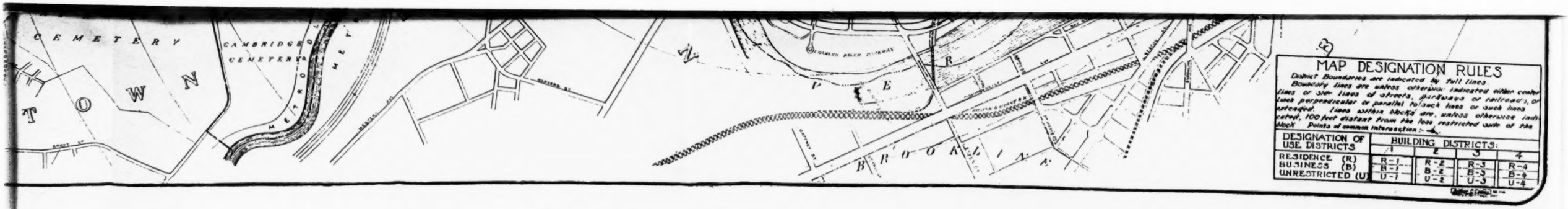

MAP DESIGNATION RULES

District Boundaries are indicated by full lines. Boundary lines are unless otherwise indicated either center lines or side lines of streets, parkways or railroads, or lines perpendicular or parallel to such lines or such lines extended. Lines within blocks are, unless otherwise indicated, 100 feet distant from the less restricted side of the block. Points of common intersection :-

DESIGNATION OF USE DISTRICTS	BUILDING DISTRICTS: 1	2	3	4
RESIDENCE (R)	R-1	R-2	R-3	R-4
BUSINESS (B)	B-1	B-2	B-3	B-4
UNRESTRICTED (U)	U-1	U-2	U-3	U-4

KEY TO ZONE MAP

District

Permitted

U-1 No change:—
All uses now permitted,
Buildings to height now permitted (100′), and covering as much of the lot.

Prohibited

None.

Permitted

U-2 All uses now permitted, 6 story or 80′ buildings.
No change in sizes of open spaces.

Prohibited

No uses prohibited.
Buildings of 7 or more stories or over 80′.

Permitted

U-3 All uses now permitted, 6 story or 80′ buildings, except within 100′ of a B or R district.

Prohibited

No uses prohibited.
Buildings of 7 or 8 stories, or over 80′, and within 100′ of a B or R district buildings of 5 or more stories or over 60′.
Yards and courts where provided must be somewhat larger than at present.

Permitted

U-4 All uses now permitted. 2½ story or 40′ buildings.

Prohibited

No uses prohibited.
Buildings of 3 or more stories or over 40′.
Yards must be considerably larger than at present.

Permitted

B-1 Residence, business, light and other non-noxious industries and similar uses. Buildings to height now permitted (100′), and covering as much of the lot.

Prohibited

Industries emitting noxious odors, dust, smoke, gas or noise.

District	
	Permitted
B-2	Residence, business, light and other non-noxious industries and similar uses. 6 story or 80' buildings. No change in sizes of open spaces.
	Prohibited
	Industries emitting noxious odors, dust, smoke, gas or noise. Buildings of 7 or more stories or over 80'.
	Permitted
B-3	Residence, business, light manufacturing chiefly for sale at retail and similar uses supplying of local needs. 4 story or 60' buildings (on large plots building may if set back 100' from every lot line have 6 stories and be 80' high.)
	Prohibited
	Heavy and general industry. Buildings of 5 stories or more or over 60' high. Yards and courts where provided must be somewhat larger than at present.
	Permitted
B-4	Residence, business, light manufacturing chiefly for sale at retail and similar uses supplying local needs. 2½ story or 40' buildings.
	Prohibited
	Heavy and general industry. Buildings of 3 stories or more or over 40' high. Yards must be provided and must be considerably larger than at present.
	Permitted
R-1	Dwellings, hotels, clubs, churches, schools, philanthropic institutions, greenhouses and gardening, with customary incidental accessory uses including garage for not more than two cars. Buildings to height now permitted (100'), and covering as much of lot.
	Prohibited
	Business and industry of all sorts.

District

Permitted

R-2 Dwellings, hotels, clubs, churches, schools, philanthropic institutions, greenhouses and gardening, with customary incidental accessory uses including garage for not more than two cars.
6 story or 80′ buildings.
No change in sizes of open spaces.

Prohibited

Business and industry of all sorts.
Buildings of 7 or more stories or over 80′.

Permitted

R-3 Dwellings, hotels, clubs, churches, schools, philanthropic institutions, greenhouses and gardening, with customary incidental accessory uses including garage for not more than two cars.
4 story or 60′ buildings (on large plots buildings other than apartment houses may if set back 100′ from every lot line have 6 stories or be 80′ high).

Prohibited

Business and industry of all sorts.
Buildings of 5 or more stories or over 60′ high.
Yards and courts where provided must be somewhat larger than at present.
Buildings must be set back 5′ and be at least 25′ from the center of any street.

Permitted

R-4 Private and two-family dwellings, clubs, churches, schools, greenhouses, and gardening, with customary incidental accessory uses including garage for not more than two cars.
2½ story or 40′ buildings, 3 story private dwellings.

Prohibited

Business and industry of all sorts.
Car barns, amusement parks, hospitals, hotels and multiple dwellings.
Buildings of 3 or more stories and over 40′ high (except 3 story private dwellings).
Yards must be provided and must be considerably larger than at present.
Buildings must be set back 10′ and be at least 30′ from the center of any street.

CITY OF CAMBRIDGE

In the year One Thousand Nine Hundred and Twenty-three

AN ORDINANCE

entitled "Construction, Use, Maintenance and Inspection of Buildings."

DIVISION 1.—ADMINISTRATION.

Section 1. The provisions of this ordinance shall apply to the construction, alteration, removal, equipment, occupation, height, area, location and maintenance of all buildings as hereinafter set forth in the City of Cambridge but not to existing buildings when specifically treated, nor to bridges, quays, wharves, railway stations, buildings on land ceded to the United States, buildings owned or occupied by the Commonwealth or Middlesex County, portable school buildings erected and maintained by the city, nor to voting booths.

In interpreting and applying the provisions of this ordinance, they shall be held to be the minimum requirements adopted for the promotion of the health, safety, convenience and welfare of the inhabitants. This ordinance shall not repeal, abrogate, annul or in any way impair or interfere with any existing provision of law or ordinance other than an ordinance entitled "Construction, Maintenance and Inspection of Buildings" which is hereby repealed, or with any rules, regulations or permits previously adopted or issued or which shall be adopted or issued pursuant to law relating to the use of buildings or premises; nor shall this ordinance interfere with or abrogate or annul any easements, covenants or other agreements between parties; provided, however, that where this ordinance imposes

a greater restriction upon the use of buildings or premises or upon height of buildings or requires larger yards, courts, or other open spaces than is imposed or required by such existing provision of law or ordinance, or by such rules, regulations or permits or by such easements, covenants or agreements, the provisions of this ordinance shall control.

Section 2. There shall be a Building Department, hereinafter designated as the Department, under the charge of a Superintendent of Public Buildings, hereinafter designated as the Superintendent, who shall also be the Inspector of Buildings. The Superintendent shall be qualified by thorough training and experience in the supervision or execution of building operations. He shall be appointed by the mayor, subject to confirmation by the city council, and he shall receive such salary as shall be fixed by ordinance.

He shall enforce the provisions of this ordinance. He, except as otherwise provided by law, under the provisions of this ordinance, shall have sole charge of all buildings. He shall have the care of all public buildings not wholly in the charge of some board or department. He shall have charge of the construction of all buildings erected by the City of Cambridge or any department thereof. He shall submit yearly to the mayor a report of the doings of the Department.

The present officers and employees of the Department shall hold their several offices and positions during their term or office or until removed or discharged.

Under civil service rules, he shall appoint a deputy superintendent, a clerk, inspectors, and employees. No person shall be appointed an inspector

construction who has not had at least five years' experience as a builder, architect, superintendent, foreman, or competent mechanic in charge of building construction.

The Deputy Superintendent shall, during the absence or disability of the Superintendent, exercise all his powers. In case the superintendent fails to appoint such deputy superintendent, the mayor may designate an employee of the Department as such deputy. No officers connected with the Department, except members of the Board of Appeal, shall engage or be interested in any other business or in the making of the plans or specifications, or in the doing of the work, or the purchase of the materials used in connection with any building for which a permit has been requested or granted by the Department, except as an owner of the building.

Under the direction of the Superintendent the clerk of the Department shall keep a record of its doings which shall be open to the public for inspection. The Superintendent may require plans and specifications of any proposed structure or for the alteration of any structure or building to be filed with him, duplicates of which, when approved by him, shall be kept at the building during the progress of the work.

If the Superintendent finds that the terms of a permit are being violated, he may, after notice mailed to the person to whom the permit was issued, order the whole or any part of the work which is being done under the permit to be stopped, and such work shall not be resumed until the terms of the permit have been complied with to the satisfaction of the Superintendent.

The Superintendent shall have power to determine any requirement to be necessary for the

strength or stability of any proposed structure or the safety of the occupants thereof even if not specifically covered by this ordinance.

Methods of construction or maintenance equivalent to those required by the provisions of this ordinance may be allowed with the written consent of the Superintendent and the Board of Appeal. A record of the required and equivalent method allowed shall be kept in the office of the Superintendent.

The Superintendent shall cause to be examined as often as is practicable every building in the course of construction or alteration, any building reported as dangerous or damaged, and all buildings in respect to which applications have been made for permits to raise, enlarge, alter, or repair, and shall make a record of every such examination.

Section 3. There shall be a board to be called the Board of Appeal, which shall be appointed by the mayor, subject to confirmation by the city council, and consisting of three members, including always one architect, and one master builder.

In the month of February of each year the mayor shall appoint one member of said board, who shall hold office for a term of 3 years from the first day of March following.

The present members of the Board of Appeal shall hold their positions during their respective terms of office unless removed according to law.

The mayor shall likewise, subject to confirmation as aforesaid, fill all vacancies in said board caused by death, resignation, or removal, for any unexpired term.

Members of said board shall hold office until their successors shall have been appointed and shall have qualified.

No member of said board shall sit on a case in which he is interested, and in case of such disqualification, or of the necessary absence of any member, the other two members shall appoint a substitute. If two or more members are so disqualified or absent, the mayor may appoint substitutes to act during disqualification or absence.

The clerk of the Department shall act as clerk of said board. The members shall serve without pay but the reasonable expenses of said board, including such clerical assistance and office expenses as shall be approved by the mayor, shall be paid.

Section 4. An applicant for a permit whose application has been refused by the Superintendent may appeal therefrom within 90 days. A person may appeal from any other decision of the Superintendent within 10 days after being notified of such decision by giving the Superintendent notice in writing of his appeal. Said notice or a certified copy thereof shall be at once transmitted by the Superintendent to the Board of Appeal.

Section 5. After notice to the appealing party, to the Superintendent, and to such other parties as the board shall order, a hearing shall be had, and said board shall affirm, annul or modify said refusal.

The board may vary the provisions of this ordinance in specific cases in regard to existing buildings where such provisions or a requirement of the Superintendent would cause manifest injustice.

Every decision of said board shall be in writing, shall require the assent of two members, except as otherwise provided herein, and shall be filed in the office of the Superintendent within 10 days after the hearing. A certified copy shall be sent by mail or otherwise to the applicant, and a copy publicly posted in the office of the Superintendent for two

weeks thereafter. If the order or the refusal of the Superintendent is affirmed, such order or refusal shall have full force and effect. If said order or refusal is modified or annulled, the Superintendent shall issue a permit in accordance therewith.

The provisions of this section shall also apply to any similar action or order of the City Electrician.

It shall be the duty of the Board of Appeal to submit to the mayor on or before the first of December of each year a report giving a summary of all decisions of the board, together with such recommendations of revisions of this ordinance as may seem advisable to them.

Section 6. (See also Board of Health regulations for additional permits required for stables and rendering works, Department of Public Safety regulations for additional permits required for certain boilers and for additional permits required for garages). The Superintendent shall grant permits for the construction, alteration, removal, equipment, occupation, or tearing down of buildings, structures, or observation stands, and for the plumbing and gas-fitting therein and for the setting and maintenance of steam boilers and furnaces and the installation and alteration of elevators. No such work shall be started without such a permit nor shall be done except in accordance with drawings bearing the approval of the Superintendent.

All applications for permits under the provisions of this ordinance shall be in writing, on forms furnished by the Superintendent, and shall include a plan at suitable scale, showing the location of the proposed buildings upon the lot. Every application shall state the name and address of the owner. The Superintendent may require the material facts set forth in the application to be verified by the

oath of the applicant; he may also require in his discretion, a survey of a lot on which any proposed building is to be erected to be filed with the application.

No building shall be used for a grain elevator or chemical works, and no boiler, engine, dynamo, furnace, or machinery for generation, transmission, or application of power except for domestic purposes shall be placed in any building without a special permit from the Superintendent covering such installation; **provided, however,** that the provisions of this paragraph shall not apply to installations for power or heating for dwellings, nor to installations of machinery for heating, ventilating, and elevator purposes, nor to the plants of the city of Cambridge, the Cambridge Electric Light Company, the Cambridge Gas Light Company, and the Boston Elevated Railway Company, nor to extensions or additions to existing plants or installations unless such extensions or additions shall, in the opinion of the Superintendent, be of a nature to become a nuisance or to injure the character of the neighborhood.

Every application for such permit shall be in writing in such form as the Superintendent may require. The applicant shall publish in at least two newspapers published in the City of Cambridge and shall also post conspicuously on the premises a copy of the application and shall deliver personally or by mail, postage prepaid, copies thereof to all the neighbors within a distance of 100 ft. from the property lines of the lot upon which the installation is proposed, and to such other persons as the Superintendent shall designate.

If no objection is filed with the Superintendent before the expiration of 10 days after the first application of the notice or within 10 days of the delivery or mailing and first posting of such notice if required, the

Superintendent shall, if the arrangement, location, construction, and character of the proposed apparatus is proper, suitable to the neighborhood, and in accordance with the provisions of this ordinance, issue a permit for the same. If the objection is filed by anyone within the time above mentioned, the application shall be referred to the Board of Appeal. After such notice as the board shall order, it shall hear the same and shall direct the Superintendent to issue a permit under such conditions as it may prescribe, or withhold the issuance of permit at its discretion.

No wall or ceiling of any building shall be lathed or otherwise covered until the Superintendent has been notified that the building is ready for such work and he has issued a permit therefor. The Superintendent shall act upon such permit within two days of its receipt.

Any permit under which no work is commenced within six months from the time of issuance shall expire by limitations.

Section 7. There shall be charged for all permits issued by the Superintendent the following fees:

Permits shall be kept posted in a conspicuous place on the building.

First-class buildings	$15.00
Second-class buildings	10.00
Third-class buildings	5.00
Alterations and additions to cost less than $300	1.00
Alterations and additions to cost $300 or more	3.00
Taking down buildings	3.00
Boilers, engines, etc.	1.00
New plumbing	3.00
Alterations in plumbing	1.00
New gas fitting	1.00
Alterations in gas fitting	0.25
Installation of elevators	3.00

Fees for permits for sheds, private garages, and like small buildings, and for preliminary permits for driving piles and for concrete foundations shall be determined in the discretion of the Superintendent, but not to exceed $5.00.

Section 8. Any notice required by this ordinance shall be sufficient if mailed postage prepaid to the address of the interested party or parties given in the application filed by them or subsequently changed by notice in writing to the Superintendent.

DIVISION 2.—DEFINITIONS.

(See also definitions in Division 26.)

Section 9. Certain words in this ordinance are defined for the purposes thereof as follows:

Alcove.—A portion of an apartment separated from an adjoining room by a partition, with an opening between the two of 60% to 80% of the area of the separating partition and with no door to close such opening. If the opening is less than 60%, or if it is closed by a door or doors, the portion thus enclosed shall be considered as a separate room, if more than 80%, the portion thus enclosed shall be considered as a part of the room.

Alteration.—Any change in the arrangement of a building, or any work affecting the structural parts of a building, or any change in walls, floors, partitions or means of exit affecting the fire resistance or the safety of persons in the building.

Apartment.—A room, or suite of two or more rooms occupied as a residence for one family.

Approved.—Where not otherwise specifically stated, the word "approved" means approved by the Superintendent.

Ashlar.—A masonry wall facing backed by masonry.

Basement.—A story or portion of a story partly underground but having at least one half of its clear height above the highest level of the adjoining ground. (See also definition of first story.)

Bearing Wall or Bearing Partition.—One carrying a load other than its own weight.

Block Stone Walls.—Walls built of stone split into approximately rectangular blocks so as to form continuous beds substantially horizontal.

Cellar.—A story or portion of a story having more than one-half of its clear height below the highest level of the adjoining ground.

Court.—An open unoccupied space, other than a yard, on the same lot with a dwelling.

An "outer court" is one extending to a street or yard.

An "inner court" is one not extending to a street or yard.

Curb Level.—The level of the established curb in front of a building measured at the middle of such front. Where no curb has been established, the city engineer shall establish such curb level or its equivalent for the purposes of this ordinance.

Dwelling.—A house or building or portion thereof which is occupied by one or more families doing their cooking on the premises.

Private Dwelling.—A dwelling occupied by one family only.

Two-family dwelling.—A dwelling occupied by two families only, one living above the other.

Multiple-dwelling.—A dwelling occupied by more than two families.

Existing.—Existing at the date of the passage of this ordinance.

Family.—A group of persons living together, whether related to each other by birth or not, and may consist of one or more persons.

First, Second and Third-class Construction.—See classification in Division 7.

First Story.—In all buildings of class 1 (residence buildings) the first story shall be the lowest habitable story.

In all buildings of class 2 (public buildings) the first story shall be the story with its level not more than 10 ft., and in all buildings of class 3 (business buildings) not more than 6 ft. above the curb level, or the level of the adjoining ground when the street line is more than 20 feet distant.

Foundation.—That part of a wall below the level of the curb, or, if a wall is not on a street, that part of the wall below the level of the highest ground next to the wall, or, if so construed by the Superintendent, that part of a party, fire or bearing wall below the cellar floor, or below the basement floor where there is no cellar.

Habitable Story.—Includes basements if occupied by one or more families, except those in multiple dwellings occupied solely by the janitor and his family.

Half-story.—Any story which is under a sloping roof, which has the point of intersection of the top of the rafters and the face of the wall less than 3 ft. above the floor level and which does not contain an independent apartment.

Height of a Building.—The vertical distance of the highest point of the roof above the mean grade of the curbs of all the streets upon which it abuts, or, if it does not abut on a street, above the mean grade of the ground adjoining the building.

Incombustible.—Sufficiently fire-retarding or fire-resisting for its purpose as shall be determined by the Superintendent.

Lot.—The plot of ground covered by and adjacent to a building and devoted exclusively to the purposes of such building, as shown by the plan furnished to the Superintendent in pursuance of Sec. 6 of this ordinance.

A "corner lot" is a lot situated at the junction of two streets, or of a street and passageway; provided that such street or passageway is at least 20 ft. wide, or where a street changes direction, provided that at such junction or change of direction the interior angle is less than 120 degrees. Any portion of a corner lot distance more than 75 ft. from the corner shall be st

ject to all the provisions of this ordinance respecting interior lots.

An "interior lot" is any lot other than a corner lot.

The "front of a lot" is that boundary line which borders on the street. In the case of a corner lot the owner may elect by statement on his plans either street boundary line as the front.

The "rear of a lot" is the side opposite the front. In the case of a corner lot with streets on three sides, or of a triangular or irregular shaped lot abutting on a corner, the rear shall be a side not bordering on a street.

The "depth of a lot" is the dimension measured from a front of the lot to the extreme rear line of the lot. In the case of irregularly shaped lots the mean depth shall be taken.

Non-bearing Wall or Non-bearing Partition.—One carrying no load except its own weight.

Occupied.—Where the word "occupied" is used it shall be construed as if followed by the words "or is intended, arranged, designed, built, altered, converted, rented, or leased to be occupied."

Party Wall.—A masonry wall that separates two or more buildings and is used or adapted for the use of more than one building.

Public Corridor.—A hall, corridor or passageway in a multiple-dwelling but not within an apartment.

Repairs.—The renewal of such superficial parts of a building as are injured by ordinary wear and tear or by weather. Special provisions made elsewhere in this ordinance may further define this definition.

Rubble Walls.—Walls built of irregular stone.

Shaft.—A shaft, whether for air, light, elevator, dumb-waiter or any other purpose, is an enclosed space within a building, extending through more than one floor.

Stair Hall.—A hall which includes the stairs, stair landings, and those portions of the building through which it is necessary to pass in going from the entrance floor to the top.

Story.—That part of a building between any floor and the floor or roof next above.

Theatre.—See Department of Public Safety regulations for definition.

Thickness of Wall.—The minimum thickness.

Used.—Where the word "used" is used it shall be construed as if followed by the words "or is intended, arranged, designed, built, altered, converted, rented, or leased to be used."

Yard.—An open unoccupied space on the same lot with a building.

A "front yard" is a yard between the front line of the building and the front line of the lot.

A "rear yard" is a yard between the extreme rear line of the building and the rear line of the lot.

The depth of such yard shall be measured at right angles to the rear line of the lot. Where the rear of the lot abuts on a street, a public alley, or a right of way dedicated to public use for the full width of the lot, the depth of the lot may be measured to the middle of such street, alley, or right of way.

A "side yard" is a yard between the side line of the building and the side line of the lot and extending from the street or front yard to the rear yard.

DIVISION 3.—CLASSIFICATION BY USE.

Section 10. For the purposes of this ordinance all buildings shall be classified according to occupancy, as residence buildings, public buildings and business buildings.

Residence Buildings

A. Private dwellings, two-family dwellings; club and boarding houses with less than 5 sleeping rooms above the second story and not over 2½ stories high.

B. Multiple-dwellings.

C. Lodging houses, dormitories, convents.

D. Hotels, club and boarding houses other than A.

Public Buildings

A. Hospitals, asylums, nurseries, detention buildings.

B. Libraries, museums, court houses, city halls, fire and police stations, railroad passenger stations.

C. Schoolhouses, college class-room buildings.

D. Churches.

E. Buildings having an assembly hall or lodge rooms; amusement halls, exhibition buildings.

F. Theatres, moving-picture houses, opera houses, music halls.

Business Buildings

A. Office buildings.

B. Stores, restaurants.

C. Storage buildings and manufacturing buildings not used for any purposes listed under D.

D. Buildings used for any of the following trades, industries or uses:—

Ammonia, chlorine or bleaching powder manufacture.

Arsenals.

Asphalt manufacture or refining.

Assaying (other than gold or silver).

Blacksmithing or horseshoeing.

Boiler making.

Brewing or distilling of liquors or spirits.

Brick, concrete products, terra cotta or tile manufacture.

Carpet or bag cleaning.

Celluloid manufacture or treatment.

Cold storage.

Contractors' yards.

Crematory other than a crematory located in a cemetery.

Disinfectant or insecticide manufacture.

Distillation of coal, wood or bones.

Drop forging.

Dyeing or dry cleaning at wholesale.

Dyestuffs manufacture.

Explosive manufacture or storage.

Fat rendering.

Fertilizer manufacture.

Flour and grain milling.

Gas (illuminating or heating) manufacture or storage, in excess of 1,000 cubic feet.

Glue, size or gelatine manufacture.

Ice manufacture.

Incineration or reduction of garbage, offal, dead animals or refuse.

Junk, scrap iron, scrap paper or rag storage or baling.

Lamp black manufacture.

Leather and leather goods manufacture.

Lime, cement or plaster of Paris manufacture.

Lumber storage except as incidental to the manufacture on the premises of furniture, boxes or other wooden products.

Milk bottling or distribution station.

Oil cloth or linoleum manufacture.

Paint, oil, varnish or turpentine manufacture.

Petroleum refining or storage in excess of 1,000 gallons.

Printing ink manufacture.

Pyroxylin manufacture or articles therefrom.

Raw hides or skins—storage, curing or tanning.

Rubber manufacture from the crude material.

Saw or planing mill except as incidental to the manufacture on the premises of furniture, boxes or other wooden products.

Shoddy manufacture or wool scouring.

Slaughtering of animals or fowls.

Smelting of iron.

Soap manufacture.

Starch, glucose or dextrine manufacture.

Stock yards.

Stone crushing.

Stone or monumental works.

Structural steel.

Sugar refining.

Sulphurous, sulphuric, nitric, or hydrochloric acid manufacture.

Tallow, grease or lard manufacture or refining.

Tar distillation or manufacture.

Tar roofing or tar waterproofing manufacture.

Textiles manufacture.

E. Car barns, foundries, light and power plants and other buildings not classified herein.

F. Amusement parks, armories, baseball parks, bath houses, grand stands, greenhouses, ice houses.

G. Stables.

H. Garages. (See also Department of Public Safety regulations.)

Section 11. Each building or part of a building shall be constructed and maintained as herein provided, according to its use; provided, however, that if in the opinion of the Superintendent, the requirements for a

part of a building conflict with the requirement of any other part of the same building, the best and safest requirement shall apply to the whole building, subject, however, to the following other provisions:

When parts of a residence building are of class B, C, or D, and other part or parts are used for public or business purposes, such other part or parts shall be separated from the residence portion at least by metal lath and plaster ceiling and partitions nogged full height with brick or solid gypsum blocks laid in mortar with cinder or stone concrete or with mineral wool and metal lathed and cement plastered on the side used for public or business purposes. No openings shall be allowed in such ceiling or partitions.

For any business buildings of class E or F the Superintendent may require construction, equipment and maintenance giving protection and safety equivalent to that obtained by the requirements for other buildings in the same building district.

Section 12. For the purpose of regulating and restricting the location of trades and industries and the location of buildings designed for specified uses, the City of Cambridge is hereby divided into three classes of use districts: Residence districts, business districts and unrestricted districts, as shown on the zone map which accompanies this ordinance and is hereby declared to be part hereof. The use districts designated on said map are hereby established. The use district designations and map designation rules which accompany said zone map are hereby declared to be part thereof. No building, structure or premises shall be erected or used for any purpose other than a purpose permitted in the use district in which such building or premises are located.

In a residence district no building shall be erected other than a building, with its usual accessories, as

anged, intended or designed exclusively for one or more of the following classes of use, as defined in section 10:—

(1) Residence Buildings A, B, C, D.

(2) Public Buildings (A), except detention buildings, B, C, D, and buildings accessory to Public Buildings D.

(3) Business Buildings F.

(4) Garages for not more than two motor vehicles and with no space for commercial trucks.

(5) College, University or Technical School Buildings and buildings accessory to them.

(6) Accessory Buildings not over one and one-half stories high on the same lot with any of the above Residences or Public Buildings; provided that, on a street occupied by street car tracks, between a business building of Class A or B, as defined in Section 10, and an intersecting street not more than 100 feet distant from such building or between two such business buildings of Class A or B not more than 100 feet apart, a business building of Class A or B not extending farther from the street occupied by street car tracks, nor higher than such building or either of them shall not be excluded.

In a residence district no building or premises shall be used for any use other than a use above specified, for which buildings may be erected and for the accessory uses customarily incident thereto unless heretofore so used. The term accessory use shall not include a business outside the building to which it is accessory or which occupies a total floor area in excess of 25% of the floor area of one story of such building, or which by reason of the appearance of the buildings or premises, or the emission of odor, smoke, dust or noise or in any other way is objectionable or detrimental to the residential character of the neighborhood or which

involves features in design not customary in buildings for the above uses or any structural alteration of the building.

Where any portion of a residence district lies within the boundaries of a Building District 4, as designated on the zoning map, no building in such portion of a residence district shall be used or erected which is arranged, intended or designed to be used for any one or more of the following classes of use as defined in Section 10:—

(1) Residence Buildings B, C, D, provided, however, that any building to be located between two residence buildings B, not more than 100 ft. apart measured along the street line and excluding from such measurement the width of any intersecting street, may be erected to a height of three stories.

(2) Public Buildings A.

(3) Business Buildings F, except Greenhouses.

In a business district no building or premises shall be used, and no building shall be erected which is arranged, intended, or designed to be used for any one or more of the following classes of use as defined in Section 10:—

Business Buildings D, E, except light or power plants of less than 5,000 K. W. hourly capacity.

In a business district no building or premises shall be used, and no building shall be erected which is arranged, intended or designed to be used for any trade industry or use that is noxious or offensive by reason of the emission of odor, dust, smoke, gas or noise; but car barns or places of amusement shall not be excluded.

Where any portion of a business district lies within the boundaries of a building district 3 or 4 as defined in Section 16 no building in such portion of a business district shall be used or erected which is arranged, intended or designed to be used for any kind of manu-

acturing, other than the manufacture of products, the ajor portion of which are to be sold at retail on the emises by the manufacturer to the ultimate consumer. No use permitted in a residence district by this sec- n shall be excluded from a business district.

In an unrestricted district a building may be erected used for any purpose in conformity with the pro- sions of this ordinance, and other existing ordi- nces and laws and regulations.

Section 13. In any building or premises any law- l use existing therein at the time of the passage of is ordinance may be continued therein, although not nforming to the regulations of the use district in hich it is maintained, or such use may be changed or verted or extended throughout the buildings, *pro- ded*, in either case, that no structural alterations, ex- t as required by then existing laws and ordinances, e made therein and no new building is erected, and ovided that in a residence or business district no build- g or premises unless now devoted to a use that is by ection 12 prohibited in a business district shall be verted to such use.

No existing building designed, arranged, intended or voted to a use not permitted by this ordinance in the strict in which such use is located shall be enlarged, tended, reconstructed or structurally altered unless ch use is changed to a use permitted in the district which such building is located, except that such ilding may be reconstructed or structurally altered to extent not greater than 50 per cent of the value of building, exclusive of foundations, for the purpose continuing therein, without any extension thereof, awful use existing therein, at the time of the pas- e of this ordinance, and such use may be continued rein, although not conforming to the regulations of use district in which it is maintained.

Section 14. The Board of Appeal may, in appropriate cases, after public notice and hearing, and subject to appropriate conditions and safeguards, determine and vary the application of the use district regulations herein established in harmony with their general purpose and intention where such provisions or a requirement of the Superintendent would cause manifest injustice as follows:—

(a) Permit the extension of an existing building and the existing use thereof upon the lot occupied by such building or upon contiguous land in the same ownership at the time of the passage of this ordinance or permit the erection of an additional building upon a lot occupied at the time of the passage of this ordinance by a commercial or industrial establishment and which additional building is a part of such establishment;

(b) Where a use district boundary lines divides a lot in a single ownership at the time of the passage of this ordinance permit a use authorized on either portion of such lot to extend to the entire lot, but not more than 25 feet beyond the boundary line of the district in which such use is authorized;

(c) Permit the extension of an existing building into a more restricted district under such conditions as will safe-guard the character of the more restricted district;

(d) Permit the restoration, subject to other provisions of this ordinance, of a building partly or wholly destroyed by fire, explosion, act of God or act of the public enemy;

(e) Permit in a residence district a central telephone exchange or any building or use in keeping with the uses expressly enumerated in Section 12 as the purposes for which buildings or premises may be erected or used in a residence district.

Section 15. The Board of Appeal may permit in a residence district a garage for more than two motor vehicles and with space for commercial vehicles, but in no case with repair facilities, provided there are on file with the Board the written consents of the owners of seventy-five per cent of the area of the private property within five hundred feet of the center of the lot on which the garage is proposed to be erected, excluding such lot and excluding any property not abutting on the same street or alley, or one of them, and not within the same block bounded by public ways more than twenty-five feet wide.

DIVISION 4.—BUILDING DISTRICTS.

Section 16. For the purpose of this ordinance, the City of Cambridge is hereby divided into four classes of building districts, designated Building Districts 1, 2, 3 and 4 respectively, as shown on the zone map which accompanies this ordinance and is hereby declared to be a part thereof. The building districts designated on said map are hereby established. The building district map designations and map designation rules which accompany said zone map are hereby declared to be part thereof. No building or part of a building shall be erected, and no existing building shall be altered, enlarged or rebuilt, except in conformity with the regulations herein prescribed for the district in which the building is located.

DIVISION 5.—BUILDING HEIGHTS.

Section 17. In building districts 1 no building or part thereof shall be erected to a height exceeding 2 times the width of the widest street on which the building stands measured from the face of any such part to the line of the street on the other side, nor exceeding 100 ft. in any case.

In building districts 2 no building or part thereof shall be erected to a height exceeding 2 times the width of the widest street on which the building stands, measured from the face of any such part to the line of the street on the other side, nor exceeding 6 stories or 80 feet in any case.

In building districts 3 no building or part thereof shall be erected to a height exceeding 1½ times the width of the widest street on which the building stands, measured from the face of any such part to the line of the street on the other side, nor exceeding 4 stories or 60 feet in any case; *provided, however,* that a building not used in any part as a dwelling for more than one family and not within one hundred feet of any street or property line or, if within an unrestricted district as designated on the zone map, not within one hundred feet of a residence district or of the nearer side of a street adjacent to a residence district may be erected to a height permitted in building districts 2.

In building districts 4 no building or part thereof shall be erected to a height exceeding the width of the widest street on which the building stands, measured from the face of any such part to the line of the street on the other side, nor exceeding 2½ stories or 40 feet in any case; *provided, however,* that any buildings to be located between two three-story buildings other than private dwellings and not more than 100 feet apart measured along the street line and excluding

from such measurement the width of any intervening street, may be erected to a height of three stories.

Section 18. On streets less than 20 feet wide the same height regulations shall be applied as on 20-foot streets.

The height upon a corner lot may be controlled by the widest street upon which the building abuts, but this height shall not extend along the narrower street more than twice the width of the narrower street.

When the width of a street opposite a building is variable, the mean width shall be used in the calculations.

All measurements shall be taken at right angles to the center line of the street.

Section 19. No part of any dwelling shall be built to a greater height than one habitable story for each 10 ft. in width of the street measured from the face of any such part to the line of the street on the other side, except that for existing accepted streets less than 40 ft. wide there may be one story for each 8 ft. of such width in Building Districts 1, 2 and 3 and *provided, further,* that a three-story dwelling may be erected on any existing accepted street 24 ft. or less wide in Building Districts 1, 2 and 3.

The provisions of this Division shall not apply to:

Parapets, pent houses and other roof structures as provided in Div. 22.

Towers, steeples, domes, statuary, cupolas, or belfries, not used for human occupancy.

Chimneys, gas holders, and coal or grain elevators.

Poles, masts with their rigging, weather vanes, vent pipes, steam exhausts, and similar parts.

DIVISION 6.—AREA REGULATIONS.

Section 20. Yards and courts shall be at every point open to the sky unobstructed by buildings or parts thereof, except for the following projections, which are permitted:—

Cornices, balconies, belt courses, window and door heads and sills projecting not more than 1/10th of the actual width of the court or yard measured to the opposite wall of a court or to the lot line, except that returns of wider cornices on front may be carried back 12 ft. into a court or yard.

Fire-escapes permitted or required by this ordinance.

First story steps, platforms and porches when no contiguous portions of the basement are occupied for habitation.

Section 21. All yards and courts shall be graded and drained in an approved manner, and, when required by the Superintendent, they shall be suitably paved as directed.

Section 22. No yard, court, or setback shall be deemed to satisfy the requirements of more than one building.

No building shall be built, moved, or altered so as to reduce any dimension herein required for yards or courts. If any lot is subdivided or changed in size so as to bring a new lot line nearer to a building than the minimum distance required for such building, then the building shall be moved or altered so as to conform to the requirements; otherwise it may be ordered vacated and removed or demolished as a nuisance as herein or elsewhere provided.

A yard or setback need not be of the same dimensions for the full height of the building; provided, that throughout the height of every story it fulfills the requirement for that story.

Section 23. In building districts 3 no part of a

building above the first floor, except one-story unenclosed porches and piazzas, shall be erected in a residence district designated on the zone map within 25 feet of the center line of any abutting street, nor within 5 feet of the line of any street; provided, that on no lot existing at the time of the passage of this ordinance shall either the width or length of the portion that may be built upon be reduced to less than 40 feet by this requirement and provided further that between existing buildings not more than 100 feet apart no building need by this requirement be erected further from the street line than the mean of their distances from such street line.

Section 24. In building districts 4, no part of a building above the first floor, except one-story unenclosed porches and piazzas, shall be erected within 30 feet of the center line of any street, nor, if in a residence district as designated on the zone map, within 10 feet of the line of any street; provided, that on no lot existing at the time of the passage of this ordinance shall either the width or length of the portion that may be built upon be reduced to less than 35 feet by this requirement; and provided, further, that between existing buildings not more than 100 feet apart no building need by the requirement be erected farther from the street line than the mean of their distances from such street line.

***Section 25.** Immediately behind every dwelling, in the rear of the lot, there shall be, except as otherwise provided, a yard extending across the entire width of the lot with every part accessible from every other part except that one garage for not more than two motor vehicles and with no space to be occupied as a domicile and with no space for commercial trucks may be built in said yard.

*Amended—May 23, 1924.

Section 26. In building districts 1, 2 and 3 the depth of rear yard behind a dwelling, for interior lots 80 or more feet in depth, shall be in accordance with the following table of minimum dimensions:—

Rear Yards

Height of dwelling in habitable stories	Districts 1 and 2	District 3
1	10	13
2	10	13
2½	10	13
3	12	15
4	14	17
5	16	
6	18	
7	20	
8	22	
9	24	
10	26	

In building district 4 no building other than an accessory building may be erected on lots 80 feet or more in depth so as to produce rear yards less than 20 feet in depth.

All dwellings on interior lots less than 80 ft. deep shall have rear yards not less than 1-80th of the depths given in the foregoing requirements for each foot in depth of the lot.

Section 27. The rear yard may be omitted when the lot upon which the dwelling is built is bounded on every side by a street, a cemetery, or a public park.

No yard shall be required behind a dwelling erected upon an interior lot less than 150 feet deep and running

alley or open passageway not less than 15 feet in width.

The depth of rear yard, for a corner lot, may be reduced to one-half the depth required for an interior lot for a length not exceeding 30 ft.

No yard shall be required behind a dwelling erected on a corner lot adjoining a lot less than 150 ft. deep and running through from street to street or from a street to an alley or open passageway not less than 15 ft. in width.

No yard shall be required behind a dwelling erected on a corner lot adjoining a lot 150 ft. or more in depth and running through from street to street or from a street to an alley or open passageway not less than 15 ft. in width; but if there be no yard an outer court upon such corner lot shall extend from the street, alley or open passageway along the line of such adjoining lot to the middle line of the block.

No yard shall be required behind a dwelling erected on a corner lot adjoining two or more lots any one of which bounds upon a single street, alley or open passageway not less than 15 ft. in width; but if there is no yard an outer court upon such corner lot shall extend from the street, alley or passageway along the line of such adjoining lot either to the extreme rear of the adjoining lot or to the extreme rear of said corner lot.

Whenever a dwelling is erected on a lot 150 ft. or more in depth and running through from street to street or from street to an alley, or open passageway there shall be left near the middle of the lot a yard extending across the entire width of the lot and not less than two times the depth required herein for a rear yard for the higher of the two buildings. The height of each building shall be fixed in relation to the street, alley, or open passageway which it faces.

If a dwelling is built behind or in front of another dwelling on the same lot there shall be left between the two buildings a yard extending across the full width of the lot and the distance between the two buildings shall not be less than two times the depth required herein for a rear yard for a building of the height of the higher of the two buildings. There shall be behind the rear dwelling a rear yard as herein required, and if this rear yard does not have access directly to a street, alley, or other public way, there shall be a passageway not less than 10 ft. wide leading from the yard between the two buildings directly to a street, alley, or other public way. The rear dwelling shall in no case be built to a greater height than is permitted for the front dwelling.

If the first story of a multiple-dwelling is used for business purposes, it may cover the whole area of the lot, and in such case the rear yard shall be maintained above the first story of the depth herein provided.

In the case of irregular shaped lots, the rear yards shall be so arranged as to be, in the opinion of the Superintendent, as nearly as possible equivalent in effect to the rear yards herein prescribed.

Where a block of dwellings is so arranged as to give, in the opinion of the Superintendent, an adequate distribution of light and air, the arrangement of yards may be varied from the requirements of this section; provided, however, that the width of the yard behind the whole block shall in no case be less than that required by this section.

Section 28. In building districts 1, 2 and 3 no side yard is required, but if any side yard is left between a dwelling and a lot line for the purpose of affording light and ventilation to rooms as required by this division, its width shall be in accordance with the following table of minimum dimensions:—

Walls may be built across the inner angles of outer courts; provided, however, that the length of such angle walls shall not be greater than 2/3rds of the actual length of the court.

Section 32. Inner courts shall be in accordance with the following table of widths and areas:—

Inner Courts

Height of building in habitable stories	Inner court		Inner court on lot line	
	Width in ft.	Area in sq. ft.	Width in ft.	Area in sq. ft.
1	12	200	7	150
2	14	300	8	200
3	16	400	9	250
4	18	500	10	300
5	20	600	11	350
6	22	700	12	400
7	24	800	13	450
8	26	900	14	500
9	28	1000	15	550
10	30	1100	16	600

An inner court on lot line shall have a length parallel to the line of not less than twice the minimum required width.

Section 33. Every inner court shall have at least one air intake.

An inner court may begin at any level and the minimum dimensions shall be determined by the table in this ordinance, according to the number of stories in the building above such level.

Where inner courts are irregular in shape, their dimensions shall be such as to provide, in the opinion of the Superintendent, a court equivalent in effect to a rectangular court as herein prescribed; provided, how

ever, that the area shall in no case be less than the minimum required in the above table.

Walls may be built across the angles of the inner courts, but the resulting unobstructed area of the court must not be less than the minimum area as above required.

In computing the area of an inner court, the additional area afforded by offsets, or recesses shall not be included.

Section 34. A vent shaft is a shaft used to light and ventilate stairways and, if covered at the top, shall have a metal skylight of the full size of shaft and shall have openings beneath the skylight on all sides, with or without louvres, of such height that the total area of such openings on any two adjacent sides shall equal the area of the shaft. Vent shafts shall be in accordance with the following table of minimum widths and areas:

Vent Shafts.

Height of shaft in stories	Ft. in width	Area in sq. ft.
1	3	15
2	3	15
3	3	15
4	4	25
5	5	35
6	6	45
7	7	55
8	8	65
9	9	81
10	10	100

Section 35. An air intake is a passageway enclosed with incombustible material, not less than 4 ft. sq. for vent shafts and not less than 3 ft. wide and 7 ft. high for courts, connecting the bottom of a vent shaft or court with a street or yard to permit circulation of air and, when serving courts, closed only by open grille doors containing not less than 15 sq. ft. of unobstructed area.

In all dwellings every inner court shall be provided with one or more horizontal air intakes at the bottom. One such intake shall always communicate directly with the street or yard.

DIVISION 7.—CLASSIFICATION BY CONSTRUCTION.

Section 36. For the purposes of this ordinance all buildings shall be classified according to construction as a first-class, second-class, and third-class.

First-Class Construction.

A first-class building shall have external and party walls of brick, stone, steel, concrete, or other equally substantial and fire resistive material; floor and roof construction of metal, reinforced concrete, terra cotta, or brick; inside walls, partitions, and stairs of incombustible materials; structural metal protected as required by Sec. 38; roofs and roof structures covered with incombustible material; bays, cornices, and projections of incombustible materials. Under and upper floors, windows and door frames, sashes, doors, interior finish, hand rails for stairs and necessary sleepers or furrings bedded in concrete or mortar may be of wood.

Second-Class Construction.

Second class A. Shall be like a first-class building except that roof construction may be of wood but covered with incombustible materials and roof shall be fire-stopped. Columns supporting roof protected as for first-class construction.

Second class B. Shall have external and party walls of brick, stone, steel, concrete, or other equally substantial and fire-resistive material; roofs and roof structures covered with incombustible materials; bays, cornices, and projections of incombustible materials; steel columns in buildings three stories or more high or if supporting masonry walls or piers, and steel beams supporting masonry walls or piers over openings wider than 10 ft. shall be protected by at least metal lath and cement plaster; first floor construction

and any floors or supports below it of first-class construction; the wooden floors and roofs fire-stopped.

Second class C. Shall have external and party walls of brick, stone, steel, concrete, or other equally substantial and fire-resistive material; roofs and roof structures covered with incombustible materials, bays of incombustible materials; girders and beams, if of wood, shall have a sectional area of not less than 56 sq. in.; columns, girders, and beams, if of metal, need not be protected except that steel columns supporting masonry walls or piers or steel beams supporting masonry walls or piers over openings wider than 10 ft. shall be protected as required by Sec. 38. Underfloors and roof plank shall not be less than 1⅝ in. thick, tongued and grooved, or splined. No bearing partitions shall be allowed, but other partitions shall be of incombustible materials or of tongued and grooved or splined plank, not less than 1⅝ in. thick, or of double matched boards. No concealed spaces, wooden furring or wooden lathing shall be allowed. Shall be entirely equipped with approved automatic sprinklers on the interior.

Second class D.—Shall be like second class C, except that no automatic sprinklers are required, but columns, girders, and beams, if of metal, even if not supporting masonry, shall be protected by at least metal lath and cement plaster.

Second class E. Shall have external and party walls of brick, stone, steel, concrete, or other equally substantial and fire-resistive material; roofs and roof structures covered with incombustible materials, bays, gutters, and cornices of incombustible material; steel columns suporting masonry walls or piers and steel beams supporting masonry walls or piers over openings wider than 10 ft. shall be protected by at least metal lath, and cement plaster. Shall be fire-stopped

basement or cellar ceiling of metal lath and cement plaster or approved plaster boards not less than ½ in. thick, well-nailed and coated with not less than ¼ in. of cement or gypsum plaster.

Third-Class Construction.

Third class A. May have wooden frame; shall be fire-stopped and walls, roofs, and dormer sides shall be covered with incombustible materials; main gutters and cornices made of, or lined with, incombustible materials; basement or cellar ceiling of metal lath and plaster or of approved plaster boards not less than ⅜ in. thick, well nailed, and coated with not less than ⅛ in. of plaster.

Third class B. May have wooden frame but shall be fire-stopped, and roofs and dormer sides shall be covered with incombustible material. No building shall be built of less than third class B construction.

Section 37. Any building, parts of which vary from other parts in classes of construction shall be rated as the lowest class unless such parts are separated by walls and floors of first-class construction with openings as permitted for fire and party walls according to Division 18.

Section 38. Buildings built in whole or in part of a better class of construction than required by this ordinance shall be required to have only such protection for structural metal as would be required in a building of the type that would be allowed in the given case. In all other cases fire-proofing for structural metal, when required, shall be of brick, terra cotta, concrete, or solid gypsum blocks, except that solid gypsum blocks shall not be used on the outside of wall forms. Metal lath and plaster shall be considered as fire-proofing only where specifically allowed.

Thickness of fire-proofing, except where metal lath and plaster are specifically allowed, shall be as follows:

Wall columns, 4 in., but may be reduced to 1 in. on the outside if covered with cast iron at least ⅜ in. thick or steel at least 3/16 in. thick.

Interior columns, 3 in. Where this column protection is likely to be broken or damaged it shall be protected by a casing of steel not less than ⅛ in. thick and 5 ft. high.

When any column has projecting flanges, the spaces between the flanges shall be filled solid with fire-proofing material against the web and extending at least 1 in. beyond the edges of the flanges.

Wall girders, 4 in. on the web and at least 1 in. beyond the edges of the flanges, plates or angles.

Interior floor girders and floor trusses 2 in. When the spaces between girder or truss flanges are filled solid with fireproofing material it need not extend more than 1 in. beyond the edges of the flanges.

Girders and trusses carrying only roof and ceiling load and protected by a suspended metal lath and plaster ceiling need not have any other fireproofing.

Girders and trusses carrying only roof load and with a clear open space at least 20 ft. high below need not be fireproofed.

In buildings not more than one story in height girders, trusses, beams, purlins and bracing carrying only roof load need not be fireproof.

Floor and roof beams, 1 in.: *provided, however*, that roof beams protected by a suspended metal lath and plaster ceiling need not have any other fireproofing.

Lintels carrying masonry walls in first-class buildings, 2 in.

Section 39. Metal lath and plaster, wherever required, shall have thickness of ¾ in. from the lath. Where cement plaster is required, the plaster shall be

at least ⅓ Portland cement. Approved equivalents may be used.

Section 40. Fire stopping for second-class buildings, when required, shall be as follows:

At all sills, dropped girts, ledger boards, plates, girders, bearing walls and bearing partition caps which support floor beams or rafters, spaces shall be filled to a height of 5 in. above floor beams, and above plates supporting rafters to the under side of the roof boarding with brick or solid gypsum blocks laid in mortar, with cinder or stone concrete or with mineral wool.

Spaces between chimneys and wooden beams and between wooden furrings on masonry walls for 5 in. above and below the floor beams with mortar or other approved incombustible material. Around pipes passing through wooden floors with metal or other approved incombustible stops.

Between the carriages of stairs twice in each flight and between rafters over dwarf partitions and between rafters at ends of ceiling beams, with closely fitted wood, tin, or galvanized iron.

Fire-stopping for third-class buildings shall be as required for second-class buildings except that closely fitted 2 in. plank may be substituted for the incombustible materials in all places except around chimneys and required stair enclosures.

In all places where fire-stopping is required the plastering shall run to the under floor.

All fire-stopping shall be in place before the lathing permit required under Sec. 6 will be issued.

Section 41. Within the building districts herein defined all buildings shall be of such class of construction as their use and height determine, and not inferior to the classes required by the following tables: *provided, however*, that nothing in this division shall

change the height limitations established by Div. 5, and *provided, further,* that for the purposes of this section a basement in a residence building shall be counted as a story when occupied by more than one family. (See definition of first story.)

RESIDENCE BUILDINGS A.

(Private dwellings, two-family dwellings; all club and boarding houses with less than 5 sleeping rooms above second story and not over 3 stories high.)

	Number of Stories.						
	1	2	2½	3	4	5	6 or more
District 1	2	2	2	2	2	1	1
Districts 2, 3 and 4	3-B	3-B	3-B	3-A	2	1	1

RESIDENCE BUILDINGS C—D.

(Lodging houses, dormitories, convents, hotels, club and boarding houses other than class A.)

	Number of Stories.					
	1	2	3	4	5	6 or more
District 1	2	2	2	2-B	1	1
Districts 2, 3 and 4	3-B	3-B	2	2-B	1	1

PUBLIC BUILDINGS A.

(Hospitals, asylums, nurseries, detention buildings.)

	Number of Stories.					
	1	2	3	4	5	6 or more
District 1	2	2	2-B	1	1	1
Districts 2, 3 and 4	3-B	3-A	2-B	1	1	1

PUBLIC BUILDINGS B.

(Libraries, museums, courthouses, city halls, fire and police stations.)

	Number of Stories.					
	1	2	3	4	5	6 or more
District 1	2	2	2-A	1	1	1
Districts 2, 3 and 4	3-B	3-A	2	1	1	1

PUBLIC BUILDINGS C.

(Schoolhouses, college classroom buildings.)

	Number of Stories.					
	1	2	3	4	5	6 or more
District 1	2	2	2-B	2-A	1	1
Districts 2, 3 and 4	3-B	2	2-B	2-A	1	1

PUBLIC BUILDINGS D.

(Buildings having an assembly hall or lodge room; churches, amusement halls, exhibition buildings.) A hall with one or more balconies shall be considered respectively as one or more stories above the story containing the main floor of the hall. The table determines the type of construction to be employed for the portion of the building up to and enclosing the assembly hall according to the floor on which the main floor of the hall is placed. If there are floors above the assembly hall and its balconies, the type of construction to be employed for the whole building shall be determined under Sec. 11. (See Department of Public Safety Regulations.)

	Number of Stories.					
	1	2	3	4	5	6 or more
District 1	2	2	2	2-B	2-A	1
Districts 2, 3 and 4	3-B	3-A	2	2-B	2-A	1

PUBLIC BUILDINGS E.

(Theatres, moving picture houses, opera houses, music halls.)

Each balcony shall be considered as a story for the requirements of this section. (See Department of Public Safety Regulations.)

	Number of Stories.					
	1	2	3	4	5	6 or more
District 1	2-A	2-A	1	1	1	1
Districts 2, 3 and 4	2-A	2-A	2-A	2-A	1	1

Provided, however, that open air theatres without balconies may be built in District 2, 3 and 4 of 3–C construction.

BUSINESS BUILDINGS A—B.

(Office buildings, stores, restaurants.)

	Number of Stories.					
	1	2	3	4	5	6 or more
District 1	2	2	2	2	2-C	1
Districts 2, 3 and 4	2	2	2	2	2-C	1

BUSINESS BUILDINGS C.

(Manufacturing and storage buildings.)

	Number of Stories.						
	1	2	3	4	5	6	7 or more
District 1	2	2	2-D	2-C	2-C	2-C	1
Districts 2, 3 and 4	3-A	3-A	2-D	2-C	2-C	2-C	1

Provided, however, that storage buildings may be built of 2-C construction to a height of 75 ft. also they may be built of steel frame with metal siding not over one story high in District 1.

BUSINESS BUILDINGS D.

(Stables.)

	Number of Stories.					
	1	2	3	4	5	6 or more
District 1	2	2	2-D	2-C	1	1
Districts 2, 3 and 4	3-B	3-B	2-D	2-C	1	1

BUSINESS BUILDINGS E.

(Amusement parks, armories, baseball parks, bathhouses, car barns, grandstands, green houses, ice houses, light and power plants, other buildings not classified herein.)

	Number of Stories.					
	1	2	3	4	5	6 or more
District 1	2	2	2	2-D	1	1
Districts 2, 3 and 4	3-A	3-A	2	2-D	2-C	2-C

Any business building without definite stories established by its design shall be considered to have one story for each 20 ft. in height. The Superintendent may vary requirements as provided in Sec. 11.

The restrictions of these tables shall not apply to wharves, nor to buildings not exceeding 27 ft. in height on wharves, nor to market sheds or market buildings not exceeding such height, nor to buildings for the storage of coal, wood, lumber or grain, if the external parts of said buildings, elevators and structures are covered with slate tile, metal or other equally incombustible material, and the mode of construction and the location thereof are approved by the Superintendent. Temporary structures to facilitate the execution of any authorized work may be erected under such conditions as the Superintendent may prescribe.

The protection for structural metal in business buildings of Classes C and E may be omitted when in the concurrent opinion of the Superintendent and the Board of Appeal, the occupation of fire equipment of the building will render such protection useless or unnecessary.

Permanent Grandstands. All permanent grandstands shall be built of second class A construction except that in Districts 2, 3 and 4 grandstands less than 10 ft. high above the ground may be of third class A construction: *provided, however,* that when such third class A grandstands are within 30 ft. of any other building the Superintendent may require additional protection by incombustible coverings to portions thereby exposed and endangering life and property. No space underneath any grandstand shall be used for any purpose unless the part so used is of first class construction.

Temporary Grandstands. Temporary grandstands may be erected for a limited time. Their construction shall be approved by the Superintendent and the permit for their construction shall state the length of time of use and the further length of time allowed for removal.

DIVISION 8.—LOADS, MATERIALS, AND STRESSES.

Section 42. Dead loads shall consist of the weight of the walls, floors, roofs, and permanent partitions. Office building partitions are included in the live loads required in Sec. 43.

The weights of various materials shall be assumed as follows:

	Lb. per cu. ft.
Birch	48
Brickwork	120
Concrete, cinder, structural	108
Concrete, cinder filling	72
Concrete, stone	144
Granite	168
Granolithic surface	144
Limestone	150
Maple	48
Marble	168
Oak	48
Pine, yellow	48
Sandstone	144
Spruce	30
Terra cotta, architectural, voids unfilled	72
Terra cotta, architectural, voids filled	120

Plastering on metal lath, exclusive of furring, 8 lb per sq. ft.

Section 43. Live loads shall include all loads except dead loads. Every permit shall state the purpose for which the building is to be used and every floor shall be of sufficient strength to bear safely the weight to be imposed thereon in addition to the dead load, but shall safely support a minimum uniformly distributed live load per sq. ft. as specified in the following table:—

Class of Building	Lb. per sq. ft.
Armories, assembly halls, and gymnasiums	100
Fire houses:	
Apparatus floors	150
Residence and stable floors	50
Garages (private), storage and repair floors	75
Garages (public), storage and repair floors	150
Grandstands	100
Hotels, lodging houses, boarding houses, dormitories, convents, clubs, hospitals, asylums and detention buildings:	
Public portions	100
Residence portions	50
Office buildings:	
First floor	125
All other floors	75
Residence buildings A and B including porches and piazzas	50
Schools and colleges:	
Assembly halls	100
Classrooms, never to be used as assembly halls	50
Sidewalks	250
(Or 8,000 lb. concentrated, which ever gives the larger moment or shear.)	
Stables (public or mercantile)	
Street entrance floors	150
Feed room	150
Carriage room	50
Stall room	50
Stairs, corridors, and fire-escapes from theaters, assembly halls, armories, and gymnasiums	100
Stairs and fire-escapes *except* from theaters, assembly halls, armories, and gymnasiums	75
Stores, retail	125

The Superintendent may require design for heavier loads than the above minimum values if, in his judgment, the purpose of the building requires it.

For buildings or structures not included in the above table, the Superintendent shall establish allowable live loads.

Section 44. Every plank, slab, and arch, and every floor beam carrying 200 sq. ft. of floor or less, shall be of sufficient strength to bear safely the combined dead and live load supported by it, but the floor live loads may be reduced for other parts of the structure as follows:—

In all buildings except armories, garages, gymnasiums, storage buildings and assembly halls, for all flat slabs of over 200 sq. ft. area reinforced in more than one direction and for all floor beams, girders or trusses carrying over 200 sq. ft. of floor, 15% reduction.

For the same, but carrying over 300 sq. ft. of floor, 25% reduction.

These reductions shall not be made if the member carries more than one floor and therefore has its live load reduced according to the table below.

In public garages, for all flat slabs of over 300 sq. ft. area reinforced in more than one direction, and for all floor beams, girders, and trusses carrying over 300 sq. ft. of floor, and for all columns, walls, piers, and foundations, 25% reduction.

In all buildings except storage buildings, wholesale stores, and public garages, for all columns, girders, trusses, walls, piers and foundations.

Carrying	1 floor	No reduction
"	2 floors	25% reduction
"	3 "	40% reduction
"	4 "	50% reduction
"	5 "	55% reduction
"	6 "	60% reduction

Section 45. Roofs shall be designed to safely support minimum live loads as follows:—

Roofs with pitch of 4 in. or less per ft., a vertical load of 40 lb. per horizontal sq. ft. applied either to half or to the whole of the roof.

Roofs with pitch of more than 4 in. and not more than 8 in. per ft., a vertical load of 30 lb. per horizontal sq. ft. and a wind load of 10 lb. per sq. ft. of surface acting at right angles to one slope, these two loads being assumed to act either together or separately.

Roofs with pitch of more than 8 in. and not more than 12 in. per ft., a vertical load of 20 lb. per horizontal sq. ft. and a wind load of 20 lb. per sq. ft. of surface acting at right angles to one slope, these two loads being assumed to act either together or separately.

Roofs with pitch of more than 12 in. per ft., a vertical load of 10 lb. per horizontal sq. ft. and a wind load of 30 lb. per sq. ft. of surface acting at right angles to one slope, these two loads being assumed to act either together or separately.

Section 46. All buildings shall be calculated to resist a pressure per sq. ft. on any vertical surface as follows:—

For 40 ft. in height .....10 lb.

Portions from 40 to 80 ft. above ground ..20 lb.

Portions more than 80 ft. above ground ..30 lb.

but the Superintendent may require a building to be designed for larger pressures than those given in the table, if, in his judgment, the exposure of the building requires it.

If the resisting moments of the materials of construction are not sufficient to resist the moment of distortion due to wind pressure without exceeding the stresses allowed in this ordinance, additional bracing shall be introduced to supply the deficiency in the moment.

Section 47. All materials shall be of such quality as to insure, in the judgment of the Superintendent, ample safety to life, limb, and neighboring property. The Superintendent shall have power to reject all materials which in his opinion are unsuitable. He may establish standards and regulations for materials covered in this ordinance or for new materials and may require tests to be made by the owner or producer or may accept tests made elsewhere in his discretion. Wherever approval is mentioned in this ordinance it shall refer to the approval of the Superintendent. In case of doubt by the Superintendent as to quality of any material the owner shall furnish a proper amount of samples for comparison with standard samples or to be subjected to such examination or tests as the Superintendent may establish. Any tests thus required shall be made under the supervision or direction of the Superintendent, but at the expense of the owner.

Section 48. Brick may be of burnt clay, sand-lime, or cement, and, except for nogging, fire-stopping, and non-bearing and curtain walls not exposed to the weather, shall be hard and strong, of quality approved as satisfactory by the Superintendent. Second-hand bricks shall be thoroughly cleaned before delivery to the building.

Section 49. The term block as used in this section shall mean any shape of block, brick, or tile which forms a hollow or cellular wall.

Concrete building blocks shall be made of Portland cement and suitable aggregates in such proportions as to develop at the age of 28 days an ultimate crushing strength per sq. in. of gross area of not less than 750 lb. when tested with the cells placed vertically and 300 lb. with the cells placed horizontally.

Terra cotta building blocks shall be hard burned and shall develop an ultimate crushing strength per

sq. in. of gross area of not less than 1200 lb. when tested with the cells placed vertically and 300 lb. with the cells placed horizontally.

The absorption of building blocks to be used for bearing or enclosing walls shall not exceed 12% in 48 hours as an average, nor more than 15% in any case.

Section 50. Sand shall be clean and not more than 6% shall pass a sieve having 100 meshes per linear in.

Sand or other fine aggregate for reinforced concrete shall be of such quality that mortar of 1 part Portland cement and 3 parts sand by weight shall show a tensile strength of not less than 90% of the strength of mortar made in the same proportions with the same cement and standard Ottawa sand. The Superintendent may require such tests when, in his judgment, they are necessary, the tests to be at the expense of the owner.

Section 51. Stone for concrete shall be clean, hard and durable.

Section 52. Lime shall be free from ashes, clinker and other foreign material and shall not be air slaked.

Section 53. Portland cement shall conform to such specifications as may be promulgated by the Superintendent, or, in the absence of such specifications, to the standard specifications of the American Society for Testing Materials as from time to time revised.

Section 54. Lime mortar shall be made of slaked lime or hydrated lime with a proper proportion of sand.

Section 55. Cement-lime mortar shall be made of 1 part Portland cement, not more than 2 parts slaked lime or hydrated lime and not more than 8 parts of sand by volume but mixtures with larger proportion of cement shall be allowed higher stresses as in Sec. 65.

Section 56. Portland cement mortar shall be made of 1 part Portland cement and not more than 3 parts of sand by volume. Lime putty or hydrated lime may be added to an amount equal to 25% of the volume of the cement.

Section 57. Concrete shall be made of Portland cement and a fine and coarse aggregate. Rubble concrete shall be made of Portland cement, a fine aggregate, and a coarse aggregate to which, after depositing, stones are added. The fine aggregate shall be sand or crusher screening passing a ¼ in. screen. The coarse aggregate shall be screened gravel, crushed stone, or cinders from steam power plants, composed of hard clean, vitrous clinker, reasonably free from sulphides, unburned or partially burned coal and ashes, but cinder concrete may be used for walls of one-story buildings, for floor slabs, roof slabs, partitions, fire-stopping, and fireproofing only. Run-of-bank gravel shall be used only when approved by the Superintendent. When one-man stones are used to form rubble concrete there shall be not less than 3 in. between the stones and the forms and between edges of adjacent stone. When stones larger than one-man size are used to form rubble concrete there shall be not less than 6 in. between the stones and the forms and between edges of adjacent stones. Stones shall be clean and wet and shall be deposited in concrete already in place before the latter has commenced to set. In piers less than 4 ft. long in greatest horizontal dimension no stone shall be larger than one quarter of the horizontal cross-section of the pier. Rubble concrete shall not be used for any projecting footing.

Joints formed between portions of concrete placed at different times shall be made in such a manner as not to weaken the completed structure. Whenever

fresh concrete joins concrete which is set or partially set, the surface of the old concrete shall be rough, clean, and thoroughly wet.

Section 58. Steel for all structural work in buildings shall conform to such specifications as may be promulgated by the Superintendent, or, in the absence of such specifications, to the requirements of Standard Specifications for Structural Steel for Buildings of the American Society for Testing Materials as from time to time revised.

Section 59. Wrought iron shall be fibrous, tough and ductile.

Section 60. Cast iron for all structural work shall conform to such specifications as may be promulgated by the Superintendent, or, in the absence of such specifications, to the requirements of the Standard Specifications for Medium Gray Iron Castings of the American Society for Testing Materials as from time to time revised.

Section 61. Timber for structural purposes shall be of quality approved by the Superintendent.

Section 62. When doubt arises as to the safe sustaining power of soil upon which a building is to be erected, the Superintendent may order borings to be made or he may order tests of the sustaining power of the soil at the expense of the owner of the proposed building. The Superintendent shall be notified before any test is made, shall be present or represented thereat, and shall decide upon the allowable load to be used and records of such borings or tests shall be filed with him. In the absence of an actual test of the sustaining power of the soil to the satisfaction of the Superin-

tendent the area of the footing shall be proportioned so that the load per sq. ft. upon the respective characters of soil shall not exceed those in the following tables :—

Loads on Soil.

Soil	Load in tons per sq. ft.
Soft clay, running sand (confined)	1 to 2
Medium blue clay, whether or not mixed with fine sand	2 to 3
Compact damp sand, hard sandy clay, hard blue clay	4
Dry hard yellow clay, boulder clay, dry sand or dry gravel	5
Hardpan, to be determined by the Superintendent, but not to exceed	10

Section 63. Wooden piles driven to refusal through loose fill or wet soil, incapable of adequately resisting lateral bending, shall be figured as columns with an area equal to the middle cross-section. The safe load on all other wooden piles driven by drop hammer shall not exceed 12 tons for spruce or Norway pine or 15 tons for yellow pine or oak, and shall be determined by the following formula :—

$$L = \frac{2\ WH}{P + 1}$$

If driven by single-acting power hammer the safe sustaining power shall be determined by the following formula :

$$L = \frac{2\ WH}{P + 0.1}$$

In both formulas
W is the weight of the hammer in lb.
L is the allowable load in lb.
H is the fall of the hammer in ft.
P is the average penetration in inches under the last three blows after the pile has been driven to a point where successive blows produce approximately equal penetrations.

Section 64. Concrete piles driven to refusal through loose fill or wet soil, incapable of adequately resisting lateral bending, shall be allowed a load not exceeding 400 lb. per sq. in. of the middle cross-section, plus 6,000 lb. per sq. in. of the steel reinforcement. The safe load for other piles shall be determined by the formulas given in Sec. 63 determined by striking the pile without cushion cap, or the Superintendent may require test piles to be loaded and may fix allowable loads based upon such tests, but he shall not allow a greater load than one half of the test load giving ¼ in. settlement. Such tests shall be under the supervision of the Superintendent and the results shall be filed in his office, but shall be at the expense of the owner.

Section 65. Any body of masonry less than 4 ft. long in its greatest horizontal dimension shall be called a pier. The height of a pier between openings having a continuous wall above or below them shall be assumed equal to the height of the opening. The height of a pier or wall supporting floors or roofs shall be assumed as the distance from top of footing or concrete floor to under side of floor or roof beams or from center to center of beams.

The safe carrying capacity of the various materials of construction shall be determined by the following working stresses:

Stresses for Brickwork.

Mortar Cement to be Portland. Parts measured by volume.	Piers of height not more than 6 times their least dimension and walls of height not more than 9 times their least dimension (Tons per sq. ft.)	Piers of height more than 6 times their least dimension and walls of height more than 9 times their least dimension (Tons per sq. ft.)
Cement mortar	20	18
2 parts cement, 1 part hydrated or slaked lime, 8 parts sand	16	14
1 part cement, 1 part hydrated or slaked lime, 6 parts sand	14	12
1 part cement, 2 parts hydrated or slaked lime, 8 parts sand	12	10
Lime mortar	8	6

Stresses for Concrete.

Cement to be Portland. The volumes given for aggregate to be the sum of the volumes of fine and coarse aggregate measured separately before mixing and proportioned so as to give a dense mixture.	Piers of height not more than 6 times their least dimension and for walls of height not more than 9 times their least dimension (Tons per sq. ft.)	Walls of height more than 9 times their least dimension (Tons per sq ft.)
1 part cement, 6 parts aggregate	30	25
1 part cement, 7½ parts aggregate	25	21
1 part cement, 9 parts aggregate	20	17
1 part cement, 4 parts run-of-bank gravel	15	10
1 part cement, 6 parts run-of-bank gravel	10	6

No plain concrete bearing pier shall have a greater height unstayed laterally than 6 times its least dimension, and no plain concrete bearing wall unless it is properly braced by cross walls, piers, or other means shall have a greater height unstayed laterally than 12 times its least dimension.

Stresses for Grout and Stone Masonry.

Cement to be Portland. Parts measured by volume	Tons per sq. ft.
Grout, 1 part cement, 1 part sand, when not less than 2 feet in least lateral dimension, not more than ½-in. joints	7
Granite masonry, 1 part cement, 2 parts sand, not more than ½-in. joints	7
Granite masonry, cement mortar, not more than ½-in. joints	6
Limestone and marble masonry, cement mortar, not more than ½-in. joints	4
Sandstone masonry, cement mortar, not more than ½-in. joints	3

Provided, however, that in stone masonry columns or in piers of excessive heights, the loads may be modified by the Superintendent.

Section 66.

Stresses for Steel and Iron.

Kind of Stress	Working Stresses lb. per Sq. In.		
	Rolled Steel	Cast Steel	Cast Iron
Bearing, direct (including bearing of stiffeners)	20,000	20,000	16,000
Bearing, pins and shop rivets	24,000		
Bearing, field rivets	20,000		
Bearing, bolts	16,000		
Extreme fibre (where top flange is stayed laterally at distances not greater than 20 times the width of flange)	16,000	16,000	*16,000 **4,000
Extreme fibre, pins and rivets	24,000		
Shearing (including gross section of plate girder webs)	10,000	9,000	2,000
Shearing, pins and rivets	10,000		
Shearing, bolts	8,000		
Direct tension	16,000	16,000	

When the top flange of a steel plate girder, beam or channel is not stayed laterally at distances of 20 times its breadth, the above stress on extreme fiber shall be reduced as follows:—

l/b.	20	25	30	35	40	45
Stress per sq. in.	16,000	15,200	14,400	13,600	12,800	12,000

l/b.	50	55	60	65	70
Stress per sq. in.	11,200	10,400	9,600	8,800	8,000

Where l is length of flange in inches.
b is breadth of flange in inches.

Section 67. Steel compression members shall not have a greater value of l/r than 160, nor have metal (except for filling) less than ¼ in. for interior columns, nor with metal less than 5/16 in. for exterior columns enclosed in masonry. The stress due to eccentric or transverse loading combined to that due to central loading shall not exceed 16,000 lb. per sq. in.

* Compression.
** Tension.

For centrally loaded steel compression members the safe load in lb. per sq. in. shall be as follows:

Steel Compression Members.

l/r	70 or less	80	90	100	110
Load per sq. in.	13,000	12,000	11,000	10,000	9,000

l/r	120	130	140	150	160
Load per sq. in.	8,000	6,000	4,000	2,000	

Where l is length of the column in inches
r is the radius of gyration in inches taken around the axis about which the column will bend.

Section 68. Concrete-filled pipe columns of steel or wrought iron may be used only when manufactured under such inspection as the Superintendent shall direct and with such stresses as he may determine.

Section 69. Cast-iron compression members shall not have a greater value of l/r than 70, nor a smaller outside diameter or side than 5 in., nor a greater unsupported length than 24 times their least lateral dimension or diameter: *provided, however,* that columns supporting roof loads only may have a value of l/r not greater than 86 and an unsupported length of not more than 28 times the least lateral dimension or diameter. They shall not have metal less than ¾ in., nor thinner than 1/12 of the greatest lateral dimension or side. The stresses due to eccentric or transverse loading, combined with those due to central loading, shall not exceed 9,000 lb. per sq. in.

Cast iron columns shall not be used where the loading is so eccentric as to cause tension.

Whenever the core of a column has shifted more than ¼ of the thickness of the shell, the strength shall be computed assuming the thickness of metal all around to be equal to the thinnest part.

For centrally loaded cast-iron compression members the safe load in lb. per sq. in. shall be as follows:—

Cast-Iron Compression Members.

l/r	10	20	30	40	50	60	70	80	86
Load per sq. in.	8600	8200	7800	7400	7000	6600	6200	5800	5560

Provided, however, that the Superintendent may reduce these loads when, in his judgment, vibrating machinery makes it advisable.

Section 70.

Stresses for Timber.

	Stress per Sq. In.				
	Southern Yellow Pine, Dense Grade	Southern Yellow Pine, Sound Grade	Spruce	White Pine	Oak
Bearing					
across grain	350	300	250	250	500
with grain	1200	900	700	700	900
Extreme fiber	1600	1200	1000	1000	1400
Shear with grain	125	85	80	80	125

Southern yellow pine for both dense and sound grades shall have defects restricted in accordance with specifications promulgated by the Superintendent, or in the absence of such specifications, in accordance with the section on defects in the rules of the Southern Pine Association for Select Structural Material.

Timber compression members shall not have knots greater in diameter than ⅓ the least dimension of the member or 4 in. in any case.

Section 71. Timber compression members shall not be used of a greater unstayed length than 30 times their least dimension for isolated columns or 40 times their least dimension for columns in partitions or truss members. The stresses due to eccentric or transverse loading combined with those due to central loading shall not exceed the maximum stress allowed in table below.

For centrally loaded timber compression members the safe load in lb. per sq. in. shall be as follows:—

Timber Compression Members.

Length divided by Least Dimension	Southern Yellow Pine, Dense Grade	Southern Yellow Pine, Sound Grade	Spruce	Pine	Oak
10 or less	1,050	800	650	650	800
15	975	740	600	600	740
20	900	680	550	550	680
25	825	620	500	500	620
30	750	560	450	450	560
35	675	500	400	400	500
40	600	440	350	350	440

Timber compression members shall not have knots greater in diameter than ⅓ of the least dimension of the member or 4 in. in any case.

Section 72. Methods for reinforced concrete are given in Div. 14. For all other materials, the following methods shall be used:

The span of beams, girders, or trusses shall be taken as the distance from center to center of the bearings. If connected to the side of column, the span shall be taken to the center of a column.

If a tension piece is loaded eccentrically or transversely the maximum combined fiber stress shall not exceed the allowed stress in tension.

An eccentric load upon a column shall be taken as affecting eccentrically only the length of column extending to the next point below at which the column is stayed securely in the direction of the eccentricity.

If a piece is exposed to tension and compression at different times it shall be proportioned and connected to resist the maximum of each kind of stress.

Base-plates, bearing plates, and grillage beams shall be figured on the assumption that the maximum bending moments are under the center of bearing.

DIVISION 9.—EXCAVATIONS AND CELLARS

Section 73. Excavations shall be properly guarded by the person making them against danger to life and so that the adjoining soil, wall, building, or structure shall not cave in.

Whenever an excavation is not carried more than 10 ft. below the curb level opposite the party line, the owner of every nearby wall, building or structure shall protect the same, so that they shall be safe, and he shall be permitted to enter upon the premises where such excavation is being made for the purpose if necessary.

Whenever an excavation is carried more than 10 ft. below curb level the person causing such excavation to be made, if afforded permission by the nearby owner, shall, at his own expense and under the direction of the Superintendent, preserve every nearby wall, building, or structure from injury, and support the same by proper foundation or retaining walls so that they shall be safe, whether said wall, building, or structure is down more or less than 10 ft. below the curb, and for this purpose proper foundations or retaining walls may be built upon the nearby premises.

If the necessary permission is not given by the nearby owner, then such nearby owner shall, at his own expense, and under the direction of the Superintendent, make his wall, building, or structure safe supporting same so that the new excavation can be made, and he shall be permitted to enter upon the premises where such excavation is being made for that purpose if necessary.

No party wall between two estates shall be added to in height or underpinned unless the whole wall when so added to or underpinned conforms to the requirements of this ordinance, and in so far as said wall is

used or intended to be used in common, all additions or underpinning thereto shall be made symmetrically with the center of gravity of the wall. If the wall is added to by building in columns or a steel or reinforced concrete frame to be used exclusively on one side, proper foundations shall be built for such columns or frame, and the parties making such installation shall have the right to extend such foundations only as far under the adjoining premises as the foundations of the party wall existed before the addition.

Section 74. The cellar and basement of every building shall be protected from dampness as approved by the Superintendent, and, if below the grade 12 ft. above mean low water, shall be waterproofed to his satisfaction.

DIVISION 10.—PILING.

Section 75. All buildings shall, if the Superintendent determines that piling is necessary, be constructed on foundation piles, and the number, diameter and bearing of such piles shall be sufficient to support the superstructure proposed. The Superintendent shall determine the grade at which the piles shall be cut. He may require any applicant for a permit to ascertain by boring the nature of the ground on which it is proposed to build, and he may require a competent inspector satisfactory to him to be on the work at all times while piles are being driven, which inspector shall keep an accurate record of the length of each pile, the weight and fall of the hammer, and the penetration of each pile for each of the last two blows of the hammer.

Section 76. Wooden piles shall be sound, straight and not less than 6 in. in diameter under the bark at the tip.

Section 77. Concrete piles shall be subject to the regulations of the Superintendent as to their materials, method of fabrication, and driving.

Section 78. The minimum distance in the clear between piles shall be not less than 12 in., except that the Superintendent may allow the piles in any one row to be closer together if, in his judgment, it is proper, but the piles adjacent to such closely spaced row shall not be less than 12 in. apart in the clear. Detached column or pier footings shall have at least 3 piles each, but column or pier footings connected by proper masonry foundations or steel construction to provide adequate lateral support in both directions may be supported by one pile if the load does not exceed that allowed by this ordinance. Light wall foundations may be supported on a single row of piles, *provided* that length unsupported laterally by proper masonry foundations or steel construction does not exceed 10 ft. A

other foundations shall be supported on at least two rows of piles, the rows to be at least 16 in. c. to c.

Piles under masonry buildings shall be capped with concrete or with block granite. If capped with concrete, the proportions shall be 1 part Portland cement to not more than 6 parts aggregate, the volume of the aggregate being the sum of the volumes of the fine and coarse aggregate measured separately before mixing and proportioned so as to give a dense mixture. If capped with block granite, each block shall have a firm bearing on not more than 3 piles and shall be not less than 12 in. thick and shall project enough to fully cover the pile caps.

Piles under steel or wooden frame buildings without masonry walls may be capped with timber not less than 6 in. thick and securely joined together, in which case the piles may be cut off at any desired grade.

DIVISION 11.—FOUNDATIONS AND MASONRY CONSTRUCTION.

Section 79. Bricks shall be wet before laying except in freezing weather. Brick walls shall be laid with full mortar joints and shall be bonded at least every 8th course by an all header or alternate-header course. Bricks laid in running bond without whole brick headers, or bricks laid in patterns without whole brick headers in the face for any length greater than 1 ft. in a pier or 3 ft. in a wall shall be bonded with metal ties. Brick footings shall not project more than 1½ in. per course, and bricks which are corbelled in chimneys or to support floors shall not project more than 1 in. per course. Corbels to support floors shall provide bearing not less than 4 in. wide, and the top of corbel shall be not less than two courses higher: but the Superintendent may allow smaller bearing for timbrel or other arch construction. All walls meeting at an angle shall be securely bonded to each other or, if one wall is built in advance of the other, shall be united by proper bonding and at intervals of 5 ft. by metal anchors of type approved by the Superintendent built into one wall to at least half the thickness of the wall and into the side or partition wall not less than 2 ft.

Brick walls with air spaces shall contain, exclusive of bonding bricks, the same amount of material as required for solid walls, and the wall inside of the air space supporting more than two floors shall be not less than 8 in. thick. The double walls shall be headed over for at least 2 courses below all floor or roof beams and shall be bonded by brick or metal ties not more than 2 ft. apart vertically and horizontally.

The walls of each story shall be carried up full thickness to the tops of the beams above.

All walls shall be anchored to the floor construction, and to the roof construction where parapet walls occur, by metal anchors of type approved by the Superintendent, at intervals of not more than 10 ft. for walls supporting floor beams or slabs and to girders and partition caps, and at intervals of not more than 20 ft. for walls parallel to wooden or steel floor beams.

Hollow brick, when hard burned and of the dimensions of common brick and when properly bonded to wall, may be reckoned as part of the thickness of the wall.

Recesses in outer walls shall leave not less than 8 in. of masonry. Horizontal recesses and wide recesses for stairs, elevators, etc., may be allowed when, in the opinion of the Superintendent, the arrangement will give proper strength.

No timber lintels or posts shall be used to support masonry walls.

Section 80. Brick, stone, concrete, or terra cotta veneer on a wooden frame shall be bonded by proper painted or galvanized metal ties not less than 2 ft. apart horizontally, and not less than 16 in. apart vertically.

Section 81. Rubble walls shall have through stones for bonding built in at intervals of not more than 3 ft. vertically and horizontally.

Section 82. Block stone walls shall have joints thoroughly filled with spalls and mortar so that each stone will come to a solid bearing.

Section 83. Bearing walls faced with ashlar shall be at least 16 in. thick. Ashlar shall not be included in reckoning the thickness of walls unless it is either at least 8 in. thick or alternately 4 in. and 8 in. to allow at least a 4-in. bond. Ashlar not having at least 4-in. bond in alternate courses shall be tied to the backing

by metal anchors, one to each block 3 ft. or less long and two to each block over 3 ft. long.

Section 84. Architectural terra cotta shall be hard burnt, properly stiffened by webs, and with all voids filled with masonry as far as the outer face of the wall.

Section 85. In case it is necessary to increase the thickness of an existing wall the thickened wall must have a total thickness of 4 in. more than required for a new wall; the lining shall be not less than 8 in. thick, shall be supported on a proper foundation; shall be laid up in Portland cement mortar, bonded to the old wall to the satisfaction of the Superintendent.

No wall shall be lined until permission has been given by the Superintendent, nor until the existing wall has been cleaned of plaster, paint, or other coating.

Section 86. Wooden floor and roof beams entering the same fire or party wall from opposite sides shall have at least 4 in. of masonry between their ends in any direction, except in case of 8 in. walls, where there must be 8 in. of masonry between ends.

Section 87. Masonry shall not be built in freezing weather unless suitable precautions are taken.

Section 88. Mortar for foundations of all masonry buildings and for any rubble wall retaining more than 15 ft. of earth, for portions of chimneys and parapets above roofs, for all hollow block walls with cells set vertical, and for walls less than 12 in. thick and exposed to the weather, shall be Portland cement mortar. Mortar for first and second-class buildings and for piers and foundations for third-class buildings, and for all chimneys below roof shall be no poorer than cement-lime mortar.

Section 89. Foundations for all first and second-class buildings, of all third-class buildings having a

cellar or basement, of all third-class buildings higher than one story, and of all third-class buildings with area greater than 300 sq. ft., shall be of masonry, and shall extend 4 ft. below any adjoining surface exposed to frost unless they rest on bed rock, and they shall reach through loam or fill to undisturbed natural earth, or shall rest on piles. All trenches shall be kept reasonably free from water when laying foundations, and no foundation shall be started on frozen ground.

The thickness of foundation walls shall, in all cases, irrespective of any other requirements of this section, be sufficient to keep the stresses in the masonry and on the soil within the working stresses prescribed by this ordinance.

Cellar or trench walls above grade not more than ft. high for third-class buildings shall have the following minimum thickness in inches:—

Concrete, solid, or concrete blocks	8
Brick	8
Block stone, one course high	8
Block stone, more than one course high	12
Rubble	16

and any of these shall be increased 4 in. if more than ft. high.

Foundations below grade for third-class buildings shall have the following minimum dimensions in inches:—

	Wall Thickness	Footing Width Except on Ledge
Concrete, solid	10	16
Brick	12	16
Block stone	16	20
Rubble	20	20

Provided, however, that walls retaining more than 6 ft. and less than 10 ft. of earth shall have the following minimum dimensions in inches:—

	Wall Thickness	Footing Width Except on Ledge
Concrete, solid	12	20
Brick	16	20
Block stone	16	24
Rubble	24	24

Foundations for masonry buildings, retaining not more than 10 ft. of earth shall be at least 4 in. thicker than the first story wall, but not less than the following dimensions in inches in any case:—

	Wall Thickness	Footing Width Except on Ledge
Concrete, solid	12	24
Brick	16	24
Block stone	16	24
Rubble	24	24

and each additional 10 ft. in depth shall be 4 in. thicker than the section above and the footing shall be widened 4 in.

Battered walls may be built, provided they give the same cross-sectional area and footing width as required above.

The Superintendent may allow reduction in the required thicknesses if the walls are of properly reinforced concrete, or are properly strengthened by steel columns or beams, or are held laterally by intermediate floors.

Isolated piers may be used instead of continuous foundations if the character of soil, building, or structure makes it necessary or advisable and the Superintendent approves.

Rubble foundation walls shall not be used for build

ings over 4 stories high. When rubble foundations are used under masonry buildings, the lowest course, if of stone, shall be good flat stones full width of footing, well bedded in mortar upon the ground.

Block stone foundations shall have the lowest course well bedded in mortar upon the ground. In projecting footing courses, the projecting portion of each stone shall be less than the width of the portion built in.

Concrete foundations shall not be poorer than 1 part Portland cement to 7½ parts of aggregate for pile cappings and for all other foundations shall be not poorer than 1 part Portland cement to 9 parts of aggregate, the volume of the aggregate in both cases being the sum of the volumes of the fine and coarse aggregate measured separately before mixing and proportioned so as to give a dense mixture: *provided, however,* that 1 part Portland cement to not more than 6 parts run-of-bank gravel may be used when the Superintendent approves. Foundations for masonry buildings shall be laid in forms both sides except for the lowest projecting footings course.

Brick footings shall project not more than 1½ in. per course and there shall be a double course at bottom, projecting not more than 3 in.

Reinforced concrete foundations and footings shall conform to requirements of Div. 14, but the concrete shall be no poorer than 1 part Portland cement and 7½ parts aggregate, the volume of the aggregate being the sum of the volumes of the fine and coarse aggregate measured separately before mixing and proportioned so as to give a dense mixture and there shall be not less than 3 in. of concrete below reinforcement or between reinforcement and the top of piles unless protected by waterproofing satisfactory to the Superintendent.

Steel grillage foundations shall have at least 6 in. of concrete below, and shall be entirely embedded in and surrounded by concrete at least 4 in. thick between steel and earth, and the concrete shall be no poorer than 1 part Portland cement and 7½ parts aggregate, the volume of the aggregate being the sum of the volumes of the fine and coarse aggregate measured separately before mixing and proportioned so as to give a dense mixture.

Section 90. For the purpose of this section a basement wall shall be construed to include any exterior wall between the ground and the first story and any party, fire and bearing walls from the top of foundations to the first floor.

The thickness of masonry walls shall in all cases, irrespective of the requirements of this section, be sufficient to keep the stresses in the masonry within the working stresses prescribed by this ordinance.

Brick walls above foundations for exterior, bearing, fire, or party walls shall have the following minimum thickness in inches:

For Private and Two-Family Dwellings with Wooden Floor Beams Spanning Not More Than 15 ft.

	Exterior Walls				Party Walls, Fire Walls, Bearing Walls			
	B'm't	1	2	3	B'm't	1	2	3
1 and 2-story buildings	12	8	8		12	8	8	
2½-story buildings	12	8	8		12	8	8	
3-story buildings	12	8	8	8	12	12	8	8

Provided, however, that wooden floor beams resting on both sides of an 8-in. wall shall not enter the wall but shall be supported upon corbels or hangers.

For All Other Residence Buildings.

Stories	B'm't	1	2	3	4	5	6	7	8
1-story building	.....	12	12						
2 " "	.....	12	12	12					
3 " "	.....	12	12	12	12				
4 " "	.....	12	12	12	12	12			
5 " "	.....	16	12	12	12	12	12		
6 " "	.....	16	16	12	12	12	12	12	
7 " "	.....	16	16	16	12	12	12	12	12
8 " "	.....	20	16	16	16	12	12	12	12	12

Provided, however, that if roof frame be of wood the top story walls may be 8 in.

For All Public and Business Buildings.

Stories	B'm't	1	2	3	4	5	6	7	8
1-story building	.....	12	12*						
2 " "	.....	12	12	12					
3 " "	.....	16	12	12	12				
4 " "	.....	16	16	12	12	12			
5 " "	.....	16	16	16	12	12	12		
6 " "	.....	20	16	16	16	12	12	12	
7 " "	.....	20	20	16	16	16	12	12	12
8 " "	.....	20	20	20	16	16	16	12	12	12

*"In case the floor area is less than 500 sq. ft. the wall thickness may be 8 inches."

Provided, however, that if any portion of any building is lower than the rest, the low portion may have walls of the thicknesses required for a building of height equal to that of the low portion.

For the purpose of this section a half story shall not be considered but any balcony or mezzanine floor of more than 10 ft. span shall be considered as forming a story in fixing the thickness of the walls which support it.

No brick pier carrying floor or roof loads shall have a greater height unstayed laterally than 12 times its least dimension, and no brick wall carrying floor or roof loads unless it is properly stayed by cross walls, piers, or other means, shall have a greater height unstayed laterally than 20 times its least dimension except by approval of the Superintendent.

Non-bearing walls not used for fire or party walls may be 4 in. less in thickness than required by the preceding table: and walls supporting stairs and stair landings only may be 8 in. less; *provided, however*, that no such non-bearing or stair wall shall be less than 8 in. thick nor have a greater height unstayed laterally than 30 times its thickness except by the approval of the Superintendent.

Curtain walls between columns, buttresses or projecting piers may be thinner than required by preceding tables: *provided, however*, that in dwellings not over three stories high such curtain walls shall not be less than 4 inches thick and in all other buildings such curtain walls shall not be less than 12 inches thick for party walls nor less than 8 inches thick for exterior walls, except that the portion between the top of one window opening and the bottom of the window opening above, if faced with metal, shall be backed by at least 4 inches of incombustible material.

Curtain walls in buildings of skeleton construction shall be securely anchored to the frame at each floor level. No curtain wall exceeding 20 feet in length shall have a greater height unstayed laterally than thirty times its thickness.

Section 81. Hollow block walls shall be the same minimum thickness as required for brick walls and may be used for bearing walls in buildings not over forty feet in height. In buildings more than forty feet in height hollow block walls may be used in the upper

forty feet and shall be of the same minimum thickness as required for brick bearing walls.

Solid, unreinforced concrete walls shall be the same minimum thickness as required for brick walls.

Reinforced concrete walls shall be of the thickness and construction required by the Superintendent.

Section 82. Masonry cornices and balconies may project as required in Div. 21 and shall balance about a point 1 in. inside the outer face of the wall with a live load of 40 lb. per sq. ft. on the projecting portion without relying upon any load above or upon the cornice, or shall be anchored to the floor construction, if the latter is of steel or reinforced concrete in an approved manner, or shall be supported by a metal frame work.

Section 83. For all buildings which have roofs sloping less than 4 in. per ft., all party walls, fire walls, and exterior walls less than 5 ft. from adjoining lot lines, except where such walls are finished with gutters, crown moulds, or cornices, shall have parapet walls of the same thickness as the walls below but shall not be required more than 12 in. thick. In buildings less than 45 ft. high the parapet shall be at least 12 in. high above roof covering, and in all other buildings the parapet shall be 2 ft. 6 in. high at least: *provided, however*, that in the first-class buildings the fire walls need not extend above the roof.

Section 84. Chimneys shall be carried to a height sufficient to protect adjoining buildings from fire and smoke, shall extend 4 ft. above any flat roof, and unless the roof covering is of incombustible material, shall extend at least 2 ft. above any part of the roof covering within 6 ft. horizontally distant, and shall be capped with incombustible material.

No chimney of stone or of hollow blocks shall be built without terra cotta flue lining for all smoke flues.

All smoke flues, except as in hereinafter provided, shall be constructed of brick or reinforced concrete not less than 4 in. thick or of hollow terra cotta or concrete blocks not less than 6 in. thick, or of stone or plain concrete not less than 8 in. thick, and shall be lined continuously from the lowest thimble or smoke chamber to the top of the chimney with well burnt terra cotta flue linings with cemented joints: *provided, however*, that if the walls are constructed 8 in. thick of brick or of solid concrete the flue linings may be omitted. If the flue linings are omitted the joints on inside of flues shall be neatly struck. The walls between the flue linings may be 4 in. thick or may be omitted for a set of flues not exceeding four in number. Rough brick jambs of fireplaces and range and grate openings shall be at least 8 in. thick if there is no flue in the jamb. The walls between the flue linings and fireplaces may be omitted: *provided, however*, that not more than one on each side of the fireplace shall be left without side partition.

When smoke flues are connected with hot water or low pressure boilers having a grate area of over 10 sq. ft., bakers' ovens, or hotel or restaurant ranges, the flues shall be lined and the walls enclosing the linings, for a height of not less than 12 ft. from the point where the smoke connection enters the flue, shall be of brick or reinforced concrete 8 in. thick or of plain concrete, hollow terra cotta, or concrete blocks not less than 10 in. thick.

When smoke flues are connected with high pressure steam boilers or other appliances producing similar flue temperatures, they shall be constructed as approved by the Superintendent.

Exterior metal smoke flues shall be located and constructed as approved by the Superintendent.

All chimneys of brick, terra cotta blocks, or con-

crete blocks shall be plastered on the outside surfaces behind all woodwork. Access for cleaning out shall be provided at the foot of all flues.

No chimney shall be corbelled from any wall less than 12 in. thick, nor for more than the thickness of the wall. Flues in party walls shall have the outside of their linings not less than 2 in. from the party line, or, if unlined, the inside of the flue shall not be less than 6 in. from the party line.

No chimney shall be supported on wood except that in one-story buildings, not over 400 sq. ft. in area, smoke flues may be built of well burned terra cotta pipe with hubs set in cement mortar, and such chimneys may be supported on wood to the satisfaction of the Superintendent.

When there is woodwork directly back of a fireplace, the backs shall have either a 2 in. air space with 4 in. of brick or concrete on each side of it, or, if of hollow terra cotta or concrete blocks, shall be at least 8 in. thick with a fireplace lining of cast iron or 4 in. of brick. Between fireplaces or where back of fireplace is exposed there shall be not less than 8 in. of masonry.

In all second and third-class buildings all fireplaces shall have hearths of incombustible materials not less than 18 in. wide from the finished facing and at least 8 in. longer on each side than the finished opening and supported on incombustible trimmer arches or slabs.

All woodwork around chimneys shall be kept at least 2 in. clear of the brickwork, except that projecting piers may be built to support girders or posts.

DIVISION 12.—STEEL CONSTRUCTION

Section 95. Materials, stresses, and methods of computation shall be as provided in Div. 8.

Section 96. Connections shall be designed to develop the full strength of the member under the conditions of loading, even though the computed stress is less.

Rivets shall be placed in accordance with good engineering practice. The diameter of rivet holes in tension members shall be assumed as $\frac{1}{8}$ in. larger than the rivet.

Section 97. Every beam, channel, lintel, or girder supported by a wall shall be properly anchored thereto, and shall have bearing plates if necessary to distribute the load properly at the stresses required by this ordinance.

Beams and channels acting as skew-backs for arches shall be designed to resist the lateral thrusts in addition to their vertical loads, and tie rods not less than $\frac{3}{4}$ in. in diameter shall be placed as near the line of thrust as practicable, and in any event shall be spaced not more than 8 times the depth of the beams, and not more than 8 ft.

Where beams or channels are used in pairs they shall be connected together with iron or steel separators near each end and at each concentrated load, and not more than 5 ft. elsewhere; and beams 12 in. or more in depth, if connected by bolted separators, shall have two bolts to each separator.

Section 98. Steel column ends shall either be machine faced and brought into actual contact or full riveted connections shall be provided to develop the strength of the columns. Latticing and tie plates shall be provided in accordance with good engineering practice.

Section 99. In proportioning the flanges of plate girders $\frac{1}{8}$ of the web may be considered as available in each flange. When the top flange is not stayed laterally at distances of 20 times its breadth the stresses shall be reduced as required in Sec. 66. Stiffeners, properly fitted at ends, shall be provided over supports and under concentrated loads with sufficient area in the outstanding legs to transmit the stresses in bearing at 20,000 lb. per sq. in. and with sufficient rivets to transmit the stresses to the web. Intermediate stiffeners shall be so spaced, that the clear distances between the stiffeners or the clear distance between flange angles shall not exceed that given by the formula.

$$d = \frac{t}{40}(12{,}000 - s)$$

where d is the clear distance between stiffeners or flange angles

t is the thickness of web

s is the shear per sq. in.

Section 100. Trusses shall be designed so that the stresses in each member can be calculated with reasonable accuracy by statical methods. The center of gravity lines of members meeting at a joint shall, if possible, intersect at a point, and the center of gravity of a group of rivets connecting one member to another shall, in general, lie as nearly as practicable in the center of gravity line of the member. Trusses shall be properly braced.

DIVISION 13.—CAST IRON CONSTRUCTION

Section 101. Materials, stresses, and methods of computation shall be as provided in Div. 8.

Section 102. Cast iron columns shall not be used in the structural frames of buildings whose height exceeds 2 times the least width of base. Cast iron columns shall be faced at ends to a true surface perpendicular to the axis to give full bearing for the cross-section of the column.

All hollow cast iron columns, except when open at both ends and without flanges, shall have two $\frac{3}{8}$ in. holes drilled on the top or bottom side of column as cast, if the columns are cast on side, one hole about 12 in. each side of the center of the length of the column, to exhibit thickness of the shell. Columns cast on end shall have two $\frac{3}{8}$ in. holes drilled by the maker at an angle of 90 degrees to each other at the middle of the column, to exhibit thickness of shell. Additional holes shall be drilled when required by the Superintendent.

Section 103. Cast iron lintels shall not be used for spans exceeding 6 ft. and shall have no metal thinner than $\frac{3}{4}$ in.

DIVISION 14.—REINFORCED CONCRETE CONSTRUCTION.

Section 104. Reinforced concrete shall mean an approved mixture of Portland Cement water, and fine and coarse aggregate, reinforced by steel.

Section 105. The Portland cement and fine and coarse aggregate for reinforced concrete work shall conform to the quality of materials as defined in division eight of this ordinance.

Section 106. Steel for reinforcement shall conform to the Standard Specifications for Steel Reinforcement Bars of the American Society for Testing Materials, as from time to time revised. It shall be free from mill scale and loose rust and shall not be coated in such manner as to weaken the bond.

Section 107. The ingredients shall be thoroughly mixed, and the mixing shall continue until the cement is thoroughly distributed and the mass is uniform in color. The consistency shall be such that the concrete will flow freely about and entirely enclose the reinforcement, but shall not be so wet as to cause separation of the ingredients in handling.

Section 108. The Superintendent may require an applicant for a permit for the structural use of concrete to have a competent inspector satisfactory to the Superintendent at all times on the work while concrete is being mixed or deposited, and such inspector shall make daily reports to the Superintendent on the progress of the work.

Section 109. Forms shall be sufficiently tight to prevent any considerable loss of material in the pouring.

Section 110. Concrete shall be used immediately after mixing, it shall not be placed in the work after it has begun to harden, and it shall be deposited in such manner and under such regulations as to secure a com-

pact mass of the best quality for the proportions used. Forms shall remain until the concrete has hardened sufficiently to carry its load safely, and shall be removed without damage to the concrete.

Concrete shall not be deposited in forms until the reinforcement has been put in place and secured against displacement.

Columns shall be poured without any interruption to the bottom side of beams or girders which they support, or to the bottom of the flare in flat slab construction. Special care shall be taken in their pouring that no voids may result.

Columns and walls shall be poured not less than three hours in advance of the beams, girders, or slabs which they support. All columns of the same type in a story shall be of concrete mixed in the same proportions.

Structural slabs shall be poured the full thickness at time of pouring floor.

Section 111. Proper precautions shall be taken in stopping concrete work to stop it at the points of low shear.

Section 112. When fresh concrete is exposed to a hot or dry atmosphere or wind, special precautions to prevent premature drying shall be taken.

Concrete shall not be deposited when the temperature is below thirty-two degrees Fahrenheit, unless adequate precautions are taken to prevent freezing.

Section 113. Main reinforcement in floor slabs shall be protected by a minimum of three-fourths of an inch of concrete: in beams, girders, columns and walls by one and one-half inches from the surface of the concrete to the surface of the main reinforcement.

In columns the outer one and one-half inches of concrete shall be regarded as fireproofing which shall be assumed to carry no stress.

Section 114. In foundations and retaining walls the steel shall be protected, and on the side toward the earth or water by a minimum of three inches of concrete.

Section 115. Slab reinforcement bars in tension shall be not farther apart horizontally than two and one-half times the total thickness of the slab. In beams and girders the lateral spacing of parallel bars shall be not less than three diameters from center to center, and the clear space between two layers of bars shall be not less than one inch.

Section 116. Calculations shall be made with reference to working stresses and safe loads rather than with reference to ultimate strength and ultimate loads, and shall be based on the following assumptions:

(a) A plane section before bending remains plane after bending.

(b) The modulus of elasticity of concrete in compressions, within the usual limits of working stresses, is constant. The distribution of compressive stresses in beams, therefore, is rectilinear.

(c) The tensile strength of the concrete in direct resistance to bending is neglected.

(d) Under compressive stresses the two materials are stressed in proportion to their moduli of elasticity.

(e) Initial stress in the reinforcement due to contraction or expansion in the concrete is neglected.

Section 117. The span length for beams and slabs simply supported shall be taken as the distance from center to center of supports, but need not be taken to exceed the clear span plus the depth of beam or slab. For continuous or restrained beams, or slabs built mon-

olithically into supports, the span length may be take as the clear distance between faces of supports. Brac ets shall not be considered as reducing the clear span i the same sense here intended, except that when bracke which make an angle of forty-five degrees or more wi the axis of a restrained beam or the plane of a slab ar built monolithically therewith, the span may be mea ured from the section where the total depth is a least one-third more than the depth at the edge of th bracket. Maximum negative moments are to be co sidered as existing at the end of the span as he defined.

Section 118. Bending moments for uniformly di tributed dead and live loads, in beams and slabs rei forced in one direction only shall be computed upon th following assumptions, where "w" is the total dea and live load per linear foot, and "l" is the span lengt

(a) for a single span freely supported bending a mid-span is

$$\frac{wl^2}{8}$$

(b) for a single span restrained at the ends ben ing at mid-span is

$$\frac{wl^2}{12}$$

(c) for two equal continuous spans freely su ported, the bending at mid-span is

$$\frac{wl^2}{10}$$

and at central support is

$$\frac{wl^2}{8}$$

(d) for two equal continuous spans restrained at supports, the bending at mid-span is

$$\frac{wl^2}{12}$$

and at central support is

$$\frac{wl^2}{10}$$

(e) for three or more equal continuous spans freely supported the bending at mid-span of the end span, and at the first interior support is

$$\frac{wl^2}{10}$$

and the bending at mid-span of interior spans and at other interior supports is

$$\frac{wl^2}{12}$$

(f) for three or more equal continuous spans restrained at supports, the bending at the first interior support for beams is

$$\frac{wl^2}{10}$$

and for the slabs is

$$\frac{wl^2}{12}$$

and the bending at all other interior supports and at mid-span of all spans is

$$\frac{wl^2}{12}$$

(g) at the restrained ends of continuous beams negative bending of

$$\frac{wl^2}{16}$$

shall be generally assumed, but this shall be increased to not more than

$$\frac{wl^2}{12}$$

for small beams running into large columns. Beams and slabs shall be considered as restrained at the ends when they frame monolithically into a structure sufficiently stiff and strong to introduce a negative bending moment into the beam at the end in amount not less than

$$\frac{wl^2}{16}$$

For continuous beams subject to other than uniformly distributed loads, the positive bending moment shall first be computed as though the beam were freely supported. The positive moment may then be reduced in the same proportion as specified above for beams loaded uniformly, and provision shall be made at the restrained ends for negative moments having the same ratio to the positive moment first computed that the negative moments specified above bear to

$$\frac{wl^2}{8}$$

Beams parallel to the main reinforcement of a one-way slab and into which no other beams frame and which are restrained at the ends by being built mon-

lithically into supporting columns shall be designed for bending moments at the ends equal to wl^2 and at $\frac{}{12}$ mid-span as follows:

When the width columns parallel to the axis of the beam is not less than fifteen per cent. of the distance center to center of columns, or twice the depth of the beam $m = wl^2$; otherwise $m = wl^2$

$\frac{}{20}$ $\frac{}{16}$

For spans of unusual or unequal length and other special cases the design shall be such as to carry out the intent of this ordinance to the satisfaction of the superintendent.

Section 119. For slabs supported on four sides and reinforced in both directions the distribution of loads shall be determined by the formula

$$r = \frac{l}{b} - 0.5$$

where

b is the breadth of slab.

l is the length of slab.

r is the proportion of load carried by the transverse reinforcement.

In placing reinforcement in such slabs account shall be taken of the fact that the bending moment is greater near the center of the slab than near the edges, and two-thirds of the calculated moments shall be assumed as carried by the center half of the slab and one-third by the outside quarters.

Beams supporting rectangular slabs reinforced in both directions shall be assumed to take the proportions of load as determined by the formula in this sec-

tion, the distribution of the load being assumed to vary in accordance with the ordinates of a parabola having its vertex at mid-span.

Section 120. Opening in floors and roofs shall be so framed as not to exceed the allowable stresses.

Section 121. In roof slabs the total depth shall not be less than three inches, and in floor slabs four inches. In "T" beams the depth below the slab shall not exceed eight times the thickness of the slab adjacent to the stem. Cinder concrete slabs shall not be less than four inches thick; they shall not exceed eight feet in span.

Section 122. Reinforcing materials which are self-centering shall not be used in spans to exceed eight feet. Fireproofing under self-center reinforcement may be of Portland cement plaster.

Section 123. If a beam or floor slab is assumed as fixed or partially restrained at a support, the column, wall, or other structure furnishing such restraint shall be proportioned to resist the stresses thereby induced.

Section 124. Where adequate bond and shearing resistance between slab and web of beam is provided, the slab may be considered an integral part of the beam, but its effective width shall not exceed one-fourth part of the span length of the beam, nor shall its overhanging width on either side of the web exceed six times the thickness of the slab.

Section 125. Columns or piers of concrete shall be reinforced when the unsupported height exceeds six times the least gross dimension, and no reinforced concrete column shall have an unsupported height of more than twelve times its least gross di-

mension except with stresses reduced from those allowed by this ordinance in accordance with the ratio.

$$\frac{24 - \frac{h}{d}}{12}$$

where h is unsupported height and d is least dimension and $\frac{h}{d}$ shall not in any case exceed eighteen.

The maximum effective area of columns shall be taken as the area within the outer one and one-half inches of concrete covering, or, in the case of hooped columns or columns reinforced with structural shapes, it shall be taken as the area within the circle enclosing the spiral or the polygon enclosing the structural shapes. Longitudinal reinforcement shall be assumed to carry stress in proportion to the respective moduli of elasticity as given in this ordinance.

Exterior columns and their reinforcement shall be so proportioned as to withstand bending in addition to the direct load without exceeding the fiber stresses specified for beams elsewhere in this ordinance.

Reinforced concrete buildings may be supported by structural steel or cast iron columns, fireproofed where required, as provided elsewhere in this ordinance.

Brackets shall be provided to transmit the load from the floors to the column. Such columns shall be computed as follows:

(a) If the brackets are placed immediately below the floor the structural steel or cast iron columns shall be assumed to carry the load of all the floors above.

(b) If the brackets are placed immediately above a floor the structural steel or cast iron columns shall be assumed to carry all the load

above the brackets, and the floor or floors below the brackets shall be carried on reinforced concrete encasing the metal, designed in accordance with the requirements of this ordinance to the next bracket below or to the foundation. In this case, however, the surrounding concrete shall be so separated from the steel or cast iron as to permit the separate action of both.

Circular hollow steel or wrought iron columns filled with concrete shall be allowed to carry a load equal to the capacity of the metal casing plus the capacity of the concrete filling. The average unit stress in the casing shall be that specified elsewhere in this ordinance for columns, and that in the concrete filling shall be in the same ratio to the unit stress in the casing which the modulus of elasticity of the concrete bears to that of the casing.

Columns with longitudinal reinforcement only shall have a steel area of not less than one per cent. and not more than four per cent. of the required effective area, and shall be allowed the stresses given in this ordinance. Longitudinal reinforcement bars shall be straight and shall be secured against lateral displacement by steel ties not less than one-fourth of an inch diameter, and placed not farther apart than sixteen diameters of the bars, nor more than twelve inches.

Columns which have longitudinal reinforcement in an amount not less than one per cent., and not more than four per cent. of the effective area, and which also have hoops or spirals to an amount not less than one per cent. of the volume of the enclosed core, spaced not farther apart in the clear than one-sixth of the diameter of the enclosed core, and in no case more than two and one-half inches, shall be allowed the stresses given in this ordinance: *provided, however*, that no such column shall have a height greater than

ten diameters of the enclosed core. The ends of hoops or spirals shall be united in such a way as to develop their full strength. The hoops or spirals shall be securely fastened to the longitudinal reinforcement or to approved spacers.

Section 126. Concrete floors with permanent blocks or forms of incombustible materials, with ribs of reinforced concrete between, shall conform to the requirements of this ordinance as far as they are applicable, but the blocks or forms shall not be assumed as taking stress. If a slab not less than two inches thick above the blocks or forms is cast monolithic with the rib, the rib and slab may be considered as a T section. If such construction forms a flush ceiling, or if a plastered ceiling on metal lath is suspended below the ribs, the fireproofing for such construction shall be that required for slabs.

Section 127. The following table gives the compressive strength in pounds per square inch which shall be assumed as the basis for design, a bag of cement weighing ninety-four pounds being assumed to measure one cubic foot in proportioning material, and the values given for aggregate to be the combined volume of fine and coarse aggregate measured separately:

Mixture	1:3	1:4½	1:6	1:7	1:7½	1:9
Stone concrete	3300	2800	2200	——	1800	1400
Cinders or slag concrete	1000	875	750	675	625	——

In all computations allowable stresses shall be used, based, as hereinafter specified, upon assumed ultimate strengths as given above, and no concrete shall be used which, when made under laboratory conditions into test cylinders eight inches diameter and sixteen inches long and tested in compression at an age of twenty-

eight days, does not show a strength at least equal t
that given in the table.

Concrete one year old shall be considered to hav
a compressive strength twenty-five per cent. greate
than that given in the table for concrete of the sam
grade and proportions.

Section 128. When compression is applied to a
portion of a concrete surface, of which the area is a
least twice that to which the load is applied, a stress o
thirty-five per cent. of the compressive strength fixe
by this ordinance shall be allowed.

For concentric compression on columns with long
itudinal reinforcement only, twenty-two and five-tenth
per cent. of the compressive strength fixed by this or
dinance shall be allowed.

Section 129. For concentric compression on col
umns, the length of which does not exceed ten diam
eters of the core, with longitudinal reinforcement com
bined with hoops or spirals, thirty-five per cent. of th
compressive strength fixed by this ordinance shall b
allowed.

Section 130. Compression on extreme fiber i
bending shall not exceed thirty-two and five-tenths pe
cent. of the compressive strength fixed by this ord
nance: *provided, however*, that adjacent to the sup
ports of continuous beams or slabs thirty-seven an
five-tenths per cent. may be used.

Section 131. In calculation of beams in whic
the maximum shearing stress in a section is used as
means of measuring the resistance to diagonal tensio
stress, the vertical shearing unit stress as comput

by the formula $v = \frac{V}{bjd}$ where v is the shearing un
stress, V is the total shear, b is the breadth of th
beam, and jd is the arm of the resisting couple, sha

not exceed the following percentages of the respective compressive strengths fixed by this ordinance.

For beams with horizontal bars only, and without web reinforcement, two per cent.

For beams with web reinforcement, consisting of vertical stirrups looped about the longitudinal reinforcing bars in the tension side of the beam, suitably anchored in the compression side and spaced horizontally not more than one-half the depth of the beam; or for beams in which longitudinal bars are bent up at an angle of not more than forty-five degrees, nor less than twenty degrees, with the axis of the beam and the points of bending are spaced horizontally not more than three-fourths of the depth of the beam apart, or both, the web reinforcement being designed, in each case, to carry two-thirds of the total shear, six per cent.

Section 132. Punching shear shall not exceed six per cent. of the compressive strength fixed by this ordinance.

Section 133. The bond stress between concrete and steel bars shall not exceed four per cent., except that the bond between concrete and approved deformed steel bars shall not exceed five per cent., and between concrete and drawn wire shall not exceed three per cent. of the compressive strength fixed by this ordinance.

Section 134. The tensile or compressive stress in steel shall not exceed sixteen thousand pounds per square inch in rods, and twenty thousand pounds per square inch in drawn wire and other approved cold stretched fabric, except that in slabs of stone concrete the tensile stress in rods shall not exceed eighteen thousand pounds per square inch, and in drawn wire and other approved cold stretched fabric it shall not

exceed twenty-two thousand five hundred pounds p
square inch.

Section 135. The modulus of elasticity of concre
shall be taken as

1-30 that of steel for cinder concrete with a co
pressive strength of 1,000 pounds per square inch
less.

1-15 that of steel for stone concrete with a co
pressive strength of 2,200 pounds per square inch,
less.

1-12 that of steel for concrete with a compressi
strength greater than 2,200 pounds per square inc
but less than 2,900 pounds per square inch.

1-10 that of steel for concrete with a compressi
strength of 2,900 pounds per square inch or more,
compressive strength referred to in all three cases b
ing that fixed by this ordinance.

Section 136. Symmetrical concentric column fo
ings shall be designed for punching shear, diago
tension and bending moment.

Section 137. The area effective to resist punc
ing shear in column footings shall be considered as t
area having a width equal to the perimeter of the c
umn or pier, and a depth equal to seven-eighths t
depth of footing from top to center of reinforc
steel.

Section 138. Shearing stresses as indicative
diagonal tension shall be measured in footings on v
tical sections distant from the face of the pier or c
umns equal to the depth of the footing from top
center of reinforcing steel.

Section 139. The bending moment in rectangu
isolated column footings at a section taken at the e
of pier or column shall be determined by multiply
the load on the cantilever projection by three-eigh

the distance from the edge of pier or column to the edge of footing. The section of maximum moment in a footing supporting a round column or pier shall be taken one-eighth the radius from the tangent toward the center. The effective area of concrete and steel to resist bending moment shall be considered as that within a width extending both sides of pier or column a distance equal to depth of footing plus one-half the remaining distance to edge of footing, except that reinforcing steel crossing the section other than at right angles shall be considered to have an effective area determined by multiplying the sectional area by the sine of the angle between the bar and the plane of the section. The bond stress in the steel shall not exceed that allowed by this ordinance.

Section 140. Floor slabs supported upon columns without beams or girders and extending two or more bays in each direction shall conform to the following requirements:

Section 141. Columns may be provided with enlarged capitals. The horizontal width of capitals shall be taken where the vertical thickness is at least one and one-half inches, and the contour of capitals shall not fall within that of an inverted cone or pyramid whose apex is on the center line of the column, whose sides incline at forty-five degrees with the vertical, and whose base lies in a plane one and one-half inches below the underside of the dropped panel, and if no dropped panel is used, below the underside of the slab, and has the same size and shape in plan as the capital. The width of capital in any direction shall not be less than one-fifth the distance, center to center, of columns in that direction, and shall be such that the allowable unit stresses elsewhere specified in this ordinance shall not be exceeded.

Section 142. A thickening of the slab on the u derside in the vicinity of the columns is termed dropped panel. The width of the dropped panel any direction shall be not less than 3-2 that of the c umn capital. The depth of the dropped panel bel the bottom of the slab shall not be more than hali slab thickness, but shall be such that the allowable stresses shall not be exceeded either in shear about column capital or in bending. The allowable unit sh to be used shall be that specified for punching shear e where in this ordinance. The allowable compres in bending shall be that specified for extreme fibers jacent to support in continuous beams.

Section 143. In flat slab construction, the m mum thickness of slab shall not be less than 1-40 the case of roofs, or 1-32 in the case of floors, o distance from center to center of the columns in longer direction. The thickness shall be such as withstand the shear about the column capital dropped panel without exceeding the allowable st herein specified for punching shear.

Section 144. For the purpose of determining bending in flat slab floors, the slab shall be consid as divided by lines parallel to the lines of columns strips whose width is one-half the distance, L, ce to center of columns measured at right angles to span of strips. The center line of alternate strips s coincide with the center line of the columns. Th shall be known as A-strips. The other strips loca midway between columns shall be known as B-str The span length of the strips shall be taken as the d tance center to center of columns, less two-thirds width of the column capital measured in the direc of the span.

Provision shall be made in the A and B strips co

ercising any panel width for the whole bending moment specified, and the proportion of the whole provided for within each strip shall not be less than that given in the following table:

	A-Strip	B-Strip	Either Strip
Positive moment, dropped panel	60%	25%	15%
Positive moment, no dropped panel	55%	25%	20%
Negative moment, no dropped panel	80%	15%	5%
Negative moment, no dropped panel	65%	20%	15%

Interior Bays.—If

l=span as given=$l_1-2c-3c$,

where c=diameter of column capital

w=total load per square foot,

whether the panels be square or oblong, and in which ever direction the span be taken, the bending moments at the critical portions of interior bays shall be assumed as follows:

Positive Bending:

The positive bending moment for a whole panel width shall be taken as

$$M = \frac{WL1^2}{25}$$

Negative Bending:

The negative bending moment for a panel width shall be taken as

$$M = \frac{WL1^2}{15}$$

Wall Bays; Restraint:

For wall bays when the wall is of reinforced concrete (l is the distance from the inside face of the

exterior column to the center of the interior colu less one-third the width of the interior column ca tal) the bending moment for strips running perp dicular to the wall shall be as follows:

Positive Bending:

The positive bending moment for a panel wi shall be taken as

$$M = \frac{WL1^2}{20}$$

Negative Bending:

The negative moment for a panel width at the terior line of columns shall be taken as

$$M = \frac{WL1^2}{12.5}$$

The negative bending moment for a panel width the wall shall in general be taken as

$$M = \frac{WL1^2}{30}$$

This may be increased, according to degree of straint, up to

$$M = \frac{WL1^2}{15}$$

for complete restraint: *provided, however,* in case co-efficient for negative bending at the wall is increa the other two bending moment co-efficients may correspondingly decreased.

Wall Bays; No Restraint:

For wall bays supported on one edge upon b walls or other construction incapable of provi adequate restraint in negative bending, 1 is dista from inner face of wall to center of interior colu less one-third the width of the interior column cap

Positive Bending:

The positive bending moment for a panel width shall be taken as

$$M = \frac{WL1^2}{16}$$

Negative Bending:

The negative bending moment for a panel width at the interior column line shall be taken as

$$M = \frac{WL1^2}{10}$$

Negative bending along such walls shall be provided for by reinforcement in the top of the slab at right angles with the wall equal to four-tenths per cent. in floors and to two-tenths per cent. in roofs of the area of cross section of the slab.

Bays discontinuous upon one or two adjacent sides shall be treated as wall bays.

When a flat slab is supported by a beam or wall on one or two sides, the half strip parallel with and adjacent to the beam or wall may be reinforced as half-a B-strip.

The bending in exterior concrete columns supporting flat slab floors shall in general be taken as

$$\frac{wL1^2}{30} + \frac{Wh}{4}$$

or more up to

$$\frac{wL1^2}{15} + \frac{Wh}{4}$$

in case of complete restraint, where W is the total load on the wall panel and h is the thickness of the exterior column.

For floors, half this bending shall be assumed as acting below and half above the slab; for roofs, the whole bending acts below the slab.

Section 145. Brackets or haunches shall be pr vided on exterior columns when necessary to transm the shear and bending from the slab to the column.

Section 146. The least dimension of interior co crete columns supporting flat slabs shall not be less th one-fifteenth the span, center to center of columns i the longer direction.

Section 147. Reinforcement shall be provided a the critical sections of all strips in sufficient quanti to withstand the bending herein specified without e ceeding the allowable unit stresses elsewhere specifie in this ordinance. Reinforcements lying obliquely the axis of any strip shall be counted as having an are effective for that strip equal to its actual area of cro section multiplied by the cosine of the angle it mak with the axis of the strip.

Section 148. No reinforcing for positive bendi shall be bent up to the top of the slab further from th center line of the column than one-fourth L where L the distance center to center of columns in the directi of the reinforcing. Positive reinforcement in A-stri shalle be provided to within 0.15 L of the center line interior columns and extending to the inside face wall columns; in B-strips shall be provided extend to within 0.10 L of the interior column line and to th inside face of wall support. Negative reinforcem in A-strips shall extend beyond the center line of th columns half the width of the column capital pl enough to develop the strength of the rods; at lea one-quarter of the negative reinforcement shall exte six inches beyond the quarter point of the panel or th fifth point of the span length. Negative reinforc ment in B-strips shall extend forty diameters beyo the center line of column, and at least half thereof sh extend to the quarter point of the panel.

For determining the stress in concrete due to the bending in each strip, the width shall be taken as the width of the strip except that for negative bending in X-strips when a dropped panel is used, the width shall be that of the dropped panel.

Section 149. Wall beams in flat slab construction shall be assumed to carry a width of floor equal to one-quarter the clear span of the beam in addition to the weight of beam and wall. Such beams, when continuous, shall be designed for a negative bending at columns equal to

$$\frac{wl^2}{12}$$

and the positive bending at mid-span shall be assumed as follows:

(a) When the width of the columns (parallel to the beam) is not less than fifteen per cent. of the distance, center to center of the columns, or twice the depth of the beam,

$$M = \frac{wl^2}{20}$$

(b) Otherwise,

$$M = \frac{wl^2}{16}$$

Section 150. In case a flat slab is supported by a brick wall, the wall shall in general be four inches thicker than the minimum thickness otherwise required by this ordinance; or have equivalent pilasters.

DIVISION 15.—FIREPROOF BLOCK CONSTRUCTION.

Section 151. Fireproof blocks for floors, wa
partitions, and fireproofing shall be of hard burn
terra cotta, concrete, or other approved material.

Section 152. Partitions of fireproof blocks sh
extend from the steel or masonry of the floor co
struction to the steel or masonry of the floor constru
tion above, except that in the upper story where the
is a space between an incombustible ceiling and
roof, these partitions need not extend above the ce
ing. Blocks shall not be less than 3 in. thick for
height of 10 ft. or less, and shall be increased 1 in.
every 4 ft. or fraction thereof. If blocks are not pla
ered on at least one side, the thickness shall be 1
greater than specified above.

DIVISION 16.—TIMBREL ARCH CONSTRUCTION.

Section 153. Timbrel arches and domes, built of overlapping tiles in two or more layers, shall be used as approved by the Superintendent.

DIVISION 17.—WOODEN CONSTRUCTION

Section 154. Stresses and quality of timber sh be as provided in Div. 8.

Section 155. All timber sizes given are nomi sizes. Wooden buildings shall have braced fram balloon frames, or types equivalent in the opinion the Superintendent, but balloon construction sh be allowed only for residence buildings not mo than 2½ stories in height and for private stabl and farm buildings.

Braced frames shall have sills, corner posts, a girts not less than 4x6 in., plates not less than t 2x4 in., and braces not less than 2x4 in. Girts a posts shall be tenoned and pinned together. posts are in more than one length they shall ha a splice at least 12 in. long.

Balloon frames shall have sills and corner po not less than 4x6 in., plates not less than two 2 in., and ledger boards not less than 1x4 in., a notched into studs 1 in. deep. Outside wall stu shall run in one length from sill to plate, shall doubled at sides and top of openings and trussed otherwise strengthened above openings more th 5 ft. wide in walls supporting floors. Floor bea shall be spiked to wall studs or to blocking of f width of studs.

Buildings three stories high shall have wall stu not less than 2x4 in., spaced not more than 16 c. to c.

Section 156. Bearing partitions shall be of l less than 2x4 in. studs, not more than 16 in. c. to and bridged the full thickness of studs once in t height of each story.

Section 157. Wooden floor and roof beams sh be not less than 2 in. thick, and, if built into m

sonry, shall have not less than 4-in. bearing, and shall be cut with a 3-in. bevel at ends to allow easy falling out in case of fire.

No floor or roof timber entering a party wall shall have less than 4 in. of masonry between it and the end of any other timber.

In second class buildings, floor beams, and, where parapets occur, flat roof beams, shall be tied together end to end and shall be anchored to the walls with metal dogs and anchors of types approved by the Superintendent so as to form continuous ties across the building parallel to the floor beams at intervals of not more than 10 ft., or at every beam when spacing exceeds 10 ft. When floor beams are parallel to the walls, the girders and partition caps shall be anchored to the walls, and if the intervals are more than 20 ft., the floor beams shall be anchored to the walls.

Every wooden header more than 4 ft. long, and carrying more than 50 lb. per sq. ft. live load, shall be properly tenoned or shall be supported on stirrup irons or hangers.

Floor beams, except in second class C and D buildings, shall be cross-bridged if more than 10 ft. span, and the distance between bridgings, or between bridgings and bearings, shall not exceed 8 ft.

Section 158. Wooden plates on masonry walls to receive sloping rafters shall be anchored to wall with bolts not less than $\frac{5}{8}$ in. diameter, not less than 2 ft., 6 in. long, and not more than 6 ft. c. to c.

Section 159. All woodwork shall be kept at least 1 in. clear of the masonry of any chimney and no woodwork shall be supported by, or nailed to, the masonry of the chimney.

DIVISION 18.—RESTRICTION OF AREAS, SIDE YARDS, PARTY AND FIRE WALLS

Section 160. All buildings shall be so constructed that the areas of separate portions enclosed by exterior walls or by exterior party and fire walls shall not be in excess of the following:

(For private, two-family, and multiple-dwelling, see Div. 29.)

Residence buildings C and D of second class construction or poorer, and of two or more stories, 5000 sq. ft.

Public buildings A, of second class B construction or poorer, and of two or more stories, 5000 sq. ft.

Public buildings, B, C, and D, of third class construction, 3000 sq. ft.

Business buildings A, B, C, D, and E not exceeding 65 ft. in height.

Fronting on	Without Automatic Sprinklers	With Automatic Sprinklers
One street	10,000 sq. ft.	16,667 sq. ft.
Two streets	12,000 sq. ft.	20,000 sq. ft.
Three or more streets	15,000 sq. ft.	25,000 sq. ft.

Business buildings A, B, C, and D exceeding 65 ft. in height.

Fronting on	Without Automatic Sprinklers	With Automatic Sprinklers
One street	7,500 sq. ft.	11,250 sq. ft.
Two streets	10,000 sq. ft.	15,000 sq. ft.
Three or more streets	12,500 sq. ft.	18,750 sq. ft.

Business buildings A, B, C, and D, of first class and second class A and C construction may have

maximum area of 30,000 sq. ft. if equipped with automatic sprinklers.

Business buildings C, D, and E in district 2 may have such areas as the Superintendent may prescribe, but not to exceed 25,000 sq. ft. if one story high nor 12,500 sq. ft. if two or more stories high unless equipped with automatic sprinklers.

The automatic sprinklers referred to in this section shall be installed to the satisfaction of the Superintendent.

Section 161. For dwellings, see Div. 6. No building shall be built nearer than 5 ft. to a lot line or nearer than 10 ft. to any other building on the same lot, unless the side wall of such building next to such lot line or other building is constructed of masonry. All openings in such walls shall be protected by approved fire doors or fire windows.

Section 162. Two contiguous buildings having independent use and access shall be considered as separate buildings and shall be separated by a party wall.

Section 163. Party and fire walls shall be of brick or solid concrete not less than 12 in. thick, except as otherwise permitted for dwellings, constructed as required by Div. 11.

Openings in party walls and fire walls shall not exceed 100 sq. ft. each in area, and the aggregate width of all openings in any such wall in any story shall not exceed 50 per cent. of the length of the wall. Every such opening shall be protected by two sets of approved fire doors separated by the thickness of the wall, one of the doors in each set to be automatic. Openings, not exceeding 144 sq. in. area, constructed and protected as approved by the Superintendent, may be permitted in any wall. Party and fire walls in buildings with roof sloping

4 in. per ft. or less shall have parapets where so re
quired in Div. 11. In buildings with roofs slopi
more than 4 in. per ft. parapets will not be require
but party and fire walls shall be carried to t
under side of the roof boarding, slab or arch.

DIVISION 19.—ENCLOSURES OF STAIRS, ELEVATORS, AND OTHER SHAFTWAYS.

Section 164. Where stairs, elevators, and other shaftways are required to be enclosed, and for all vent shafts, the enclosure walls shall extend to the under side of the roof boarding, slab or arch: *provided, however*, that elevator shaftings running to the top floor shall extend 3 ft. above the roof. The enclosure construction shall be as follows or an approved construction at least equivalent:

For first and second-class buildings as follows:—

(1) Brick or solid concrete or concrete block walls built according to the provisions of this ordinance and not less than 8 in. thick.

(2) Terra cotta or solid gypsum blocks at least 4 in. thick, if supported on reinforced concrete or steel framing properly fireproofed. Blocks shall be plastered on both sides.

(3) Metal lath and cement plaster, making solid 2 in. partition, or hollow partition with metal studs and metal lath and cement plaster at least ¾ in. thick on each side if supported on reinforced concrete or steel framing properly fireproofed.

(4) Wire glass in metal frames, no light of glass being over 720 sq. in. area. To be supported on reinforced concrete or steel framing properly fireproofed.

For third-class buildings as follows:

Walls of 4-in. studs, firestopped at each floor with brick or solid gypsum blocks laid in mortar or with cinder or stone concrete or with mineral wool and covered on both sides with metal laths and cement plaster or with approved plaster boards not less than ½ in. thick and coated with at least ¼ in. of cement or gypsum plaster, except that elevator shaftways shall be built as required for first and second-class buildings.

Section 165.

Stairways. All doorways leading into stairways r quired to be enclosed shall be fitted with appro self-closing fire doors in metal or metal cove frames. Windows in interior enclosure walls shall approved fixed fire windows.

Vent Shafts. Openings in vent shafts and sha ways other than stairways or shaftways included Department of Public Safety regulations, shall be fi with approved fire doors or fire windows which are be automatic if required by the Superintendent. (See also Department of Public Safety regulation

Section 166. Elevator, stair and other shaftwa in addition to any requirements of the Departmen Public Safety shall be enclosed with the construct required above as follows:—

(For stairways in dwellings, see Div. 20.)

Hospitals, asylums, nurseries, and detention bu ings to have all stairways enclosed.

Libraries, museums, court houses, city halls, fire police stations, 3 stories or more high, to have at le one stairway enclosed.

Buildings having an assembly hall or lodge roo churches, amusement halls, and exhibition buildings have all basement stairs enclosed, and, if such roo are in the third story or above, shall have one stairw enclosed.

For schoolhouses, college classroom buildings, t atres, moving picture houses, opera houses, and mu halls, see Department of Public Safety regulations.

Office buildings, if 4 or 5 stories high, shall have least one stairway enclosed. If 6 or more stories hi shall have all stairways enclosed: *provided, howev* that they need not be enclosed in first story if openi into a public lobby leading direct to exit and separat

from rest of building by first-class construction; and *provided, further,* that independent flights connecting not more than 2 stories need not be enclosed.

Buildings more than 3 stories high and used above the first floor for the storage or sale of merchandise or for restaurant purposes, shall have all stairways enclosed except independent flights connecting not more than 2 stories.

Manufacturing buildings over 2 stories high shall have all stairways enclosed.

Stables, 3 or more stories high, shall have all stairways enclosed except runway for horses from first to second floors.

(For garages, see Department of Public Safety regulations.)

Amusement parks, armories, baseball parks, car barns, foundries, grandstands, green houses, ice houses, light and power plants, mill and other buildings constructed for special industries, and other buildings not classified in this ordinance shall have stairways enclosed when required by the Superintendent.

Vent Shafts and Chutes. Vent shafts and other vertical shaftways or chutes of more than 4 sq. ft. area shall be enclosed if they extend through more than one floor. Shaftways or chutes of 4 sq. ft. or less in area shall be made of, or lined with, incombustible materials if they extend through more than one floor.

DIVISION 20.—EXITS, CORRIDORS, AND STAIRS.

(For two-family and multiple-dwellings, see Div. 2
(See also Department of Public Safety regulations

Section 167. In addition to provisions of the D partment of Public Safety regulations, the requi ments of this division shall apply to all buildings e cept dwellings.

Section 168. Wherever dimensions of exits a proportioned to the number of occupants, the Sup intendent shall determine the probable number of o occupants.

Section 169.

Number. Every floor above the first shall have a least two exits leading directly or indirectly to stre placed as far apart as practicable and so far as po sible arranged so that from every portion of the fl there shall be access to one of two stairways with passing any other. At least one stairway shall co tinue to the roof, if flat.

Marking. All doors to exits in buildings 2 or m stories in height shall be plainly marked by a sign a by a red light unless specifically excepted by the Sup intendent.

Lighting. All exits shall be adequately lighted artificial light.

Section 170.

Width. Required stairways except in dwellings a except when serving less than 150 persons, shall at least 3 ft. 8 in. wide between faces of walls, or 3 4 in. wide between face of walls and face of balustra or between faces of two balustrades. If posts proj above tops of rails, the required width shall be ma

ained between the face of the post and the face of the wall or post opposite.

For stores and restaurants, the aggregate width of the stairs leading down from each story above the first shall be 20 in. for each 100 persons or fractions thereof occupying such floors and all the floors above, and the aggregate width of the stairs leading up from each story below the first shall be 20 in. for each 100 persons or fraction thereof occupying such floor and all the floors below.

Construction. All stairs in buildings required to be of first-class construction and all stairways required to be enclosed in buildings of second-class construction shall have all stairs, stair landings, and floors inside the enclosure of metal or masonry, except that hand rails may be of wood. All stairs shall be framed for the loads required in Div. 8. Required stairs shall have not more than 15 nor less than 3 risers between landings, landings shall be not less than 3 ft. 6 in. wide between risers, the risers shall not exceed 8 in. in height and the treads shall not be less than 9 in. wide, exclusive of nosings. Required stairs shall have no winders but the Superintendent may allow curved steps of large radius. Required stairs over 4 ft. wide shall have hand rails on both sides, and, if over 7 ft. wide, shall have center hand-rails, terminating at their upper ends in posts at least 6 ft. high. No closet shall be built under any stairway of wooden construction except in one or two-family dwellings.

Section 171. An outside metal or reinforced concrete fire-escape, approved as to construction and access, shall be considered equivalent to one of the required exits for all buildings not more than 3 stories high except for stores, restaurants, and manufacturing buildings. A fire-escape may project over a public way.

Section 172. A horizontal exit leading to another floor area beyond a fire wall or party wall shall be considered equivalent to one of the required exits from such a floor if such an exit be through an opening constructed as required in Div. 18 or by an approved outside balcony, and *provided* that such other floor area shall be large enough to contain the joint occupancy, allowing 4 sq. ft. per person.

Section 173. When the total occupancy of a building above the second floor is more than 500 persons one of the exits shall be an approved smoke-proof tower with access at each floor by means of outside balcony or open air vestibule.

Section 174.

Corridors. Public exit corridors shall be not less than 3 ft. 8 in. wide, and any corridor serving as an exit for more than 200 persons shall have a width of 20 in. for each 100 persons and fraction thereof so served. Corridors connecting two flights of stairs in the line of travel of an exit shall be at least as wide as the wider of the two flights.

Doors serving more than 50 persons and opening into public corridors or to enclosed stairs shall open toward the stairs. Rooms accommodating more than 50 persons shall have at least two doors leading to exits, each door to be not less than 3 ft. wide, and with an aggregate width of 20 in. for each 100 persons or fraction thereof accommodated. Any fastenings on doors required by this section shall be such as may be easily opened from the inside without the use of keys; *provided, however,* that this requirement shall not apply to the doors of rooms where persons are held under legal restraint.

Section 175. Outside and vestibule doors for buildings accommodating more than 100 persons, except

one-story stores of less than 2000 sq. ft. area, shall swing out or shall be double-swing or revolving doors; *provided, however*, that this requirement shall not prohibit the use of sliding doors which are in addition to the required exits or sliding doors which may be used for closing buildings after business hours.

DIVISION 21.—BAYS, BALCONIES, PORCHES, CORNICES, AND OTHER PROJECTIONS

Section 176. No parts of a building other th those mentioned in this division, shall project over a street, square, or other public way.

Cornices, balconies and bay windows may proje a distance equal to 1/20 of the width of the pub way; *provided, however*, that in no case shall they any part so project more than 3 ft.

No bay projecting over a public way shall be mo than 15 ft. long and no two such bays in any sto shall be less than 5 ft. apart.

When a building is set back to allow increase height, the line of setback required for the increase height shall be considered the street line beyond whi projections shall be allowed on the portions of t building that are so set back.

Window caps and sills, string courses and oth projections may project 1/4 of the projection allowe for a cornice of the wall on which they occur.

Rain water leaders and conductors shall not proje more than 7 in.

Fire escapes, required or permitted by this ordinanc may project according to regulations of the Superi tendent.

When any projection occurs it shall be at least 1 ft. above the level of the curb.

Signs and marquises shall be as prescribed in D 24 of this ordinance.

DIVISION 22.—ROOFS AND ROOF STRUCTURES.

Section 177. No roof shall be arranged as to discharge water upon a public way or adjoining property.

Section 178. Chimneys shall be carried above roofs as provided in Div. 11.

Section 179. Every building over one story high and having a flat roof shall have permanent access to the roof, from the inside of the building through an opening at least 2 ft. x 3 ft. with fixed step ladder or stairs. Such opening shall have direct access from a public corridor or stair hall and shall not be equipped with a lock.

Section 180. No roof houses shall be constructed on any building above the highest level permitted for the roof, except over stairs, tanks, elevators and elevator machinery, and such roof houses shall be no larger than is necessary to serve properly their purpose, and as approved.

Method of construction and exterior covering of roof houses shall be at least equivalent to the construction permitted for the roof, according to Div. 7. In second and third-class construction the scuttle or the door to a roof house may be of wood core covered with metal.

Section 181.

Roof Tanks. Support and construction of roof tanks shall be according to regulations or approval.

Section 182. All skylights on roofs of buildings of second and third-class construction shall be of metal and glass, and shall not be at any point higher than 6 ft. above the highest level permitted for the roof except with special approval. Skylights not glazed with wire glass shall be protected with approved wire screens.

Section 183. No elevated staging or stand for observation purposes shall be constructed or occupied upon the roof of any building.

DIVISION 23.—FIRE DOORS, WINDOWS, AND SHUTTERS.

Section 184. A "self closing door" is one normally kept closed by gravity, a weight, or a spring attachment. An "automatic fire door" is a door equipped with fusible link so as to close by the action of heat.

Fire doors, fire windows, and fire shutters shall, where required, be built in accordance with detailed regulations for construction and installation issued by the Superintendent.

Where fire windows are required in exterior walls, fire shutters may be substituted with the approval of the Superintendent.

Section 185. Doors and windows in the following locations shall be equipped with approved fire doors and fire windows:

In stairway enclosures as required by Div. 19.

Adjacent to fire-escapes, permitted or required by this ordinance, according to regulations of the Superintendent.

Openings in walls of buildings for offices, stores, restaurant, manufacturing, and storage within 20 ft. of another building.

Openings in any walls overlooking and within 50 ft. of the roof of a theatre stage.

Doors to boiler rooms as required in Div. 27.

Doors in party and fire walls herein required or permitted, and shall be so equipped on both sides of the wall.

Windows in party walls above the roof of an adjacent building.

Windows in walls within 5 ft. of a party line.

Elsewhere as the Superintendent may require on account of special hazard.

DIVISION 24.—SIGNS, BILLBOARDS, MARQUISES, FLAG POLES, AND POLES OR FRAMES ON BUILDINGS TO SUPPORT WIRES.

(See also Department of Public Safety regulations.)

Section 186. Within building district 1 no sign or billboard of greater area than 12 sq. ft. shall be erected on any building unless made of or covered with incombustible material, nor over 100 sq. ft. area unless of incombustible material, nor over 200 sq. ft. area unless of skeleton construction.

The top of a sign or billboard placed upon a building shall not be higher than the height allowed for any building upon that lot.

The top of any sign or billboard placed upon a third-class building in district 2 shall not be higher than 12 ft. above the eaves.

Signs or billboards erected on the ground in district 2 shall not be placed within 20 ft. of any building unless made of or covered with incombustible material.

Signs or billboards placed on the ground must have a space of at least 4 ft. between the ground and the bottom of such sign or billboard.

Section 187. The Superintendent shall make regulations governing the character, construction and maintenance of signs, billboards, and marquises wherever placed, and of flag poles, and poles or frames placed on buildings to support wires.

DIVISION 25. -TEMPORARY STRUCTURES AND BARRICADES.

Section 188. During building operations temporary structures in connection therewith and barricades, sidewalk coverings, and scaffolds, to safeguard both workmen and public, shall be constructed and maintained, where required, subject to the approval of the superintendent.

DIVISION 26.—PLUMBING.

Section 189. Certain words in this division are d
fined for the purpose thereof as follows:

Air pipes or back-air pipes. Air pipes connected
not more than 3 traps and extending toward the ma
soil pipe or the outer air.

Fixture. A receptacle or outlet for the disposal
waste water or other matter and connected with t
waste, soil, or drain pipe of a building.

House drain. The horizontal portion of the dra
age system in the basement or cellar connecting t
soil and waste pipes to the house sewer 10 ft. outs
the inside face of the wall.

House sewer. That part of the drainage system
a building connecting the house drain to the pub
sewer.

Repair of leaks. Such repairs as are necessary
protect property, but do not involve any extens
change in construction.

Soil pipe. That part of the drainage system, 4
or more in diameter, between the house drain and
highest fixture in the building.

Surface drain. A connection with house drain
allow escape of surface water or overflow.

Ventilation pipe. The extension of the soil p
from the highest fixture to and through the roof.

Vent pipes. General lines of back-air pipes conne
ing with more than 3 fixtures.

Y-branch. A branch at sufficient angle to direct
flow and prevent backing up.

Section 190. Every plumber, before doing a
work in a building, shall, except in the case of rep
of leaks, file at the office of the Superintendent, up
blanks for that purpose, an application for a perm
and, if required by the Superintendent, a plan or sket

of the work to be performed; and no such work shall be done in any building without a written permit from the Superintendent.

Section 181. The plumbing of every building shall be separately and independently connected outside the building with the public sewer, if such sewer is provided, or with a proper and sufficient private drain or sewer laid outside the building, or if a sewer is not accessible, with a proper cesspool. Several buildings may have a common sewer connection if such connection is approved by the Superintendent.

Section 182. The waste pipe of every independent sink, basin, bathtub, water-closet, slop-hopper, urinal, or other fixture shall be furnished with a separate trap, which shall be placed as near as practicable, to the fixture which it serves; *provided, however*, that a sink and a set of 3 wash trays or a bathtub and basin, when they adjoin, may be connected to a waste pipe through one 5-in. round trap, when the outlets are not over 4 ft. apart. Not more than 4 wash-bowls or sinks in a continuous line shall be connected to the house drain through one 5-in. round trap. Two water-closets or other traps on the same level with not more than 3 ft. of waste pipe connecting with the soil or waste pipe not more than 18 in. below the top water line of the trap, shall not require other vent than the continuation of the soil or waste pipe full size for its whole length. Lateral branches of soil or waste pipe, if more than 20 feet in length, shall be extended through the roof in a size prescribed for the ventilation of the attached trap, or be vented into a main vent line. All connections on lead waste and back air pipes and of lead pipes to brass ferrules and soldering nipples shall be full size wiped soldered branch, round, or flanged joints. Soil and waste pipes shall have proper T-Y or

Y-branches for all fixtures connections. No connection to lead bends for water-closets or slop-sinks shall be permitted, except the required back air pipe where a continuous vent is not practicable.

Earthenware traps shall have heavy brass floor plates soldered to the lead bends if used, and bolted to the trap flange, and the joint made gas tight with red or white lead. Rubber washers for floor connections shall not be used.

Section 193. All drip or overflow pipes shall be extended to some place in open sight, and in no case shall any such pipe be connected directly with the drain pipe. No waste pipe from a refrigerator or other receptacle in which provisions are stored shall be connected directly with a drain or other waste pipe. The waste pipes from all other fixtures shall be connected directly with a drain pipe. Refrigerator wastes connecting with two or more stories shall be supplied with a trap on the branch for each floor and extended through the roof.

Section 194. Except as otherwise provided, traps shall be protected from siphonage or air pressure by special iron or brass air pipes of a size not less than the waste pipes they serve; back air pipes shall not be connected to the trap or branched into the waste pipe except where a continuous vent is not practicable, but a suitable non-siphon trap may be used without a back air pipe upon the approval of the Superintendent. Back air pipes shall enter the waste pipe within 18 in. from the trap and shall be a continuation of the waste pipe. Lead air pipes may be used only for short connections, where they are exposed to view. Air pipes for water-closet traps shall be connected to the highest point of bend, and may be of 2-in. bore if for not more than 3 fixtures and less than 30 ft. in length; if for

more than 3 fixtures or more than 30 ft. in length, they shall be of 3-in. bore. Air pipes shall be run as direct as practicable, and, if $1\frac{1}{2}$ in. or less in diameter, shall not exceed 30 ft. in length. Two or more air pipes may be connected together or with a vent pipe; but in every such case the connection shall be above the top of the fixture. The trap for the upper fixture on a line of soil or waste pipe, if within 5 ft. of the stack in a horizontal line, shall not require a special air pipe, unless the outlet is branched into a stack more than 18 inches below the top water line of the trap. Diameters of vent pipes shall not be less than 2 in. for main vents through less than 7 stories; 3 in. for water-closets on more than 3 stories and for other fixtures in more than 7 stories. All vent pipes shall be at least 4 in. in diameter when they pass through the roof. Vent lines shall be connected at the bottom with a soil or waste pipe or with the drain in such a manner as to prevent accumulation of rust scale and properly to drip the water of condensation. Offsets shall be made at an angle of not less than 45 degrees.

Except for water-closets, all traps not provided with special air pipes shall be suitable non-siphon traps. Bottle traps shall be not less than 4 in. in diameter and if of lead, shall be 8 in. long and made of 8-lb. metal. All trap screws shall be water-sealed.

In buildings where a series of bathrooms or kitchens are located directly over each other and have a common soil or waste pipe, the branch vents in each story shall connect to the vent line above the top of the highest fixture on each floor and the vent line shall connect to the ventilation pipe or to the extension of the waste pipe above the highest fixture in the building.

In the case of batteries of water-closets or other fixtures, the special air pipe from each trap may be omitted, provided the soil or waste pipe, undimin-

ished in size, is continued from the farthest fixture through the roof or is looped into the ventilation pipe or the extension of the waste pipe above the highest fixture in the building.

Section 195. The diameters of soil and waste pipes shall be not less than those given in the following table:

	Inches
Soil pipes	4
Main waste pipes	2
Main waste pipes for kitchen sinks on 5 or more floors	3
Branch waste pipes for laundry tubs	1½
Branch waste for kitchen sinks	1½
Branch waste for urinals	1½
No branch waste for other fixtures shall be less than	1½

Provided, however, that, with the approval of the Superintendent, a 3-in. soil pipe may be used for one water closet where it is not practicable to use a 4-in pipe.

Section 196. House drain, soil, waste, ventilating pipes, vents and back air pipes shall be of sufficient size and made of extra heavy cast iron pipe if under ground and if above ground shall be made of extra heavy cast iron, galvanized wrought iron or standard weight brass pipe of not less than No. 13 Stubbs gauge within the building except that lead pipes may be used for short connections exposed to view; *provided*, that house sewer, house drain, soil, or waste pipe shall be of wrought iron or steel.

House drains shall be extended in cast iron not less than 10 ft. from the inside face of the wall, beyond the inside face of the wall, beyond and away from the building.

Drainage and vent piping above ground shall be supported by clamps to the woodwork, iron drive hooks to brick walls, bolted clamps to steel beams, or supported on masonry. Proper manholes shall be supplied to reach cleanouts and traps. Every house drain shall have a fall of not less than $\frac{1}{4}$ in. per ft. and shall be extended as a soil and ventilation pipe through the roof undiminished in size, and to a height not less than 2 ft. above the roof and not less than 1 ft. above the top of any window within 15 ft. and not less than 8 ft. above the roof if the roof is used for drying clothes or as a roof garden. Every house drain shall be provided with a running trap not less than the size of the drain and with a heavy brass cleanout.

Changes in direction shall be made with curved pipes, and all connections with horizontal or vertical pipes shall be made with Y-branches. Saddle hubs shall not be used. All house drain pipes shall be exposed to sight within the building if such exposure is practicable, and shall not be exposed to pressure where they pass through the wall.

Section 197. (See Divisions 29 and 31 for water-closets in dwellings.) Every water-closet or urinal shall be supplied with water from a tank or flushing valve through a pipe of not less than $1\frac{1}{4}$ in. diameter.

Section 198. No steam, vapor, or water of a temperature over 130 degrees Fahr. shall be discharged from any premises into any sewer, drain, or catch-basin, nor shall any matter or thing be discharged into any sewer which may tend to cause an obstruction of the public sewer or a nuisance or a deposit therein or any injury thereto.

All high-pressure steam boilers shall be connected with a blow-off tank of a capacity not less than 30 per cent. of the largest boiler connected with such tank.

The location of, and the connections, to such blow-off tank shall be subject to the approval of the Superintendent.

No steam exhaust or steam drip, unless it be provided with a cooling tank of a capacity approved by the Superintendent, or unless it be connected with the blow-off tank, shall connect with any drain leading to a sewer. Every blow-off tank shall be supplied with a vapor pipe not less than 2 in. in diameter, which shall be carried above the roof and above the highest windows of the building.

The Superintendent may require such additional means for cooling the blow-off tanks by the injection of cold water or otherwise as may be necessary to reduce the temperature of the water passing from the blow-off tank so that it shall not exceed 130 degrees Fah.

Section 199. (See also Department of Public Safety regulations.) Every building from which, in the opinion of the Superintendent, grease may be discharged in such quantity as to injure the sewer, shall have a special grease trap, satisfactory to the Superintendent. Every building in which gasoline, naphtha or other inflammable compounds are used for business purposes shall be provided with a special trap, satisfactory to the Superintendent, so designed as to prevent the passage of such material into the sewer, and ventilated with a separate pipe rising to a point 4 ft. above the roof. The waste pipe of every wash stand for vehicles shall be provided with a sand box of sufficient capacity.

The waste pipe from the sink of every hotel, boarding house, restaurant, or other public cooking establishment shall be connected to a grease trap of sufficient size, easily accessible to open and clean, placed as near as practicable to the fixture that it serves.

Fixtures and waste pipes in chemical laboratories shall be installed in accordance with plans approved by the Superintendent.

The drainage of stable fixtures shall be constructed in accordance with plans approved by the Superintendent.

Section 200. Rain-water leaders shall not be connected to soil and waste pipe at any point above the basement or cellar ceiling. Wherever a surface drain is installed in a cellar or basement, it shall be provided with a deep seal trap and back water valve. Drain pipes from fixtures in cellars and basement liable to back flow from a sewer shall be supplied with back water valves. (See Statutes as to separation of rain water and sewage piping.)

Section 201. Cast-iron pipes shall be uncoated, sound, cylindrical, and smooth, free from cracks and other defect, of uniform thickness and of the grade known to commerce as "extra heavy." If buried underground, they shall be coated with asphaltum or red lead.

Pipe, including the hub, shall weigh not less than the following average weights per linear ft.:

Diameter in inches	2	3	4	5	6	7	8	10	12
Wt. per lin. ft. in lb.	5½	9½	13	17	20	27	33⅓	45	54

Brass pipe for soil, waste, vent, and back air pipes shall be thoroughly annealed, seamless, drawn brass tubing, of not less than No. 13 Stubbs gauge.

Lead bends shall not be less than 8 lb. per ft.

Screw caps for clean-outs shall have a solid square or hexagonal nut, not less than ½ in. high, with a least diameter of 1½ in. The bodies of brass cleanout ferrules shall be at least equal in

weight and thickness to the calking ferrule for the same size pipe.

No slip joints or unions shall be used on traps, waste, vents, or back air pipes. Threaded connections on brass pipe shall be of the same size as pipe threads for the same size of pipe and shall be tapered. Connections between lead and iron shall be made by brass sleeves or screw nipples wiped to the lead and calked or screwed into the iron.

All joints in cast iron pipe shall be made with picked oakum and molten lead run full, and be made gas tight. No cement joints nor connections between iron and cement or tile pipe or brick drains shall be made within any building.

Fittings on wrought-iron vent or back air pipes shall be cast-iron threaded fittings. Fittings to "plumber's tubing" shall be heavy weight, with sharp threads.

Section 202. Pipes or other fixtures shall not be covered or concealed from view until approved by the Superintendent or his representative, who shall examine or test the same within two working days after notice that they are ready for inspection. The lathing permit required by Sect. 6 will not be issued until this test is satisfactory.

Plumbing shall not be used unless, when roughed in, the wastes, vents, back air pipes, and traps are first tested by water or sufficient air pressure in the presence of the Superintendent or his representative when, in his opinion, such testing is practicable.

DIVISION 27.—HEATING AND VENTILATION.

(See also Department of Public Safety regulations.)

Section 203. All rooms containing a furnace or boiler or other heating apparatus having a grate area of more than 10 sq. ft. shall be separated from all parts of the building by masonry partitions at least 8 in. thick and by ceilings of metal lath and cement plaster or with approved plaster boards not less than ½ in. thick and coated with at least ¼ in. of cement or gypsum plaster when the floor above is not of first-class construction. The openings in the partitions shall be fitted with approved self-closing doors.

Section 204. No boiler shall be placed or maintained under a public way.

No furnace or boiler shall be placed upon a wooden floor.

The tops of all heating furnaces, boilers, and smoke pipes shall be at least 12 in. below the nearest woodwork. All ceilings immediately over a furnace or boiler and for 2 ft. on each side thereof, and all ceilings within 12 in. of indirect radiators, shall, except under floors of first-class construction, be metal lathed and plastered or covered with metal or with approved plaster boards not less than ½ in. thick and coated with at least ¼ in. of cement or gypsum plaster and any woodwork or wooden lath partitions within 4 ft. of any furnace or boiler shall be covered with metal to a height of 4 ft. above the floor. Metal shields shall be so attached as to leave at least a 1-in. air space behind.

No smoke pipe shall project through any exterior wall or window, and every smoke pipe shall be kept at least 18 in. clear below any wooden floor beams

or wooden lath and plaster and not less than 12 clear below any wooden floor beams which are p tected with metal lath and plaster unless, in eith case, an approved metal shield is installed, but sh not be less than 6 in. clear below in any event e cept for floors of first-class construction. Whe smoke pipe passes through a combustible partit it shall be protected by a ventilated thimble for least 6 in. outside the pipe.

No horizontal hot air pipe leading from a furna shall be less than 6 in. from any woodwork unl the woodwork be covered with loose fitting tin the pipe be covered with approved protective m terial.

All hot air pipes passing transversely throu combustible partitions must be double tin pi with 1 in. between. No hot air pipe shall be pla within any wood stud partition or other wood closure less than 8 ft. distant from a furnace, unl placed inside another pipe or unless the surroundi spaces are lined as approved.

Hot air register boxes in the floors or partiti of all buildings shall be set in soapstone or equ fireproof borders not less than 2 in. in width, sh be made of tin plate, and shall have double pi and boxes properly fitted to the stone borde There shall be one register without valves louvres in every furnace installation.

No steam or hot air pipe shall be placed with in. of any woodwork.

Every ventilating flue shall be constructed of lined with incombustible material.

All heating pipes that are to be buried in pa tions shall be in place before the lathing per required by Sect. 6 will be issued.

DIVISION 28.—GAS FITTING.

Section 205. Gas-fitting shall mean the work of putting together any fitting, pipe, or fixture, or other appliances, which are to contain gas for heat, light, or power purposes.

Section 206. No pipe or fitting shall be covered or concealed from view until inspected by the Superintendent or his representative.

All work shall be installed in accordance with permit granted, complete in all details, properly fastened and made tight, before making appointment for inspection, and 24 hours' notice shall be given the Superintendent on all appointments for inspection. The lathing permit required by Sect. 6 will not be issued until this inspection is complete.

Gas shall not be turned on in any building, or turned on in any new fit contained in any new or old building, until the piping, fixtures, appliances, and the work performed has been approved by the superintendent.

In buildings that have been damaged by fire, the gas piping and fixtures shall not be used or the gas turned on until authorized by the Superintendent.

All gas pipes shall be of the best quality wrought iron or steel, all fittings of malleable iron. Galvanized fittings and pipe are prohibited.

Meter connection of lead pipe shall be of the same size as the fit or riser, and brass solder nipples shall be used on all connections except on flange meters.

No second-hand pipe shall be installed in any building, without the written permission of the Superintendent.

All cast fittings, such as cocks, swing joints, double centers, and nozzles, shall be standard fittings,

except for factory use, where extra heavy or m fittings shall be used. The plugs of all cocks mus be ground to a smooth and true surface for the entire length, be free from sand holes, have not le than ¾ in. bearing on all cast fittings and ⅛ in. o all turned fittings, have two flat sides on the end i the washer and have two nuts instead of a n screw. All stop pins to keys on cocks or fixtur shall be screwed into place.

All brass tubing used for arms or stems of fi tures shall be at least No. 18 standard gauge a full size outside so as to cut a full thread. S threads on brass pipe shall screw in at least ⅛ All rope or square tubing shall be brazed or solder into fittings and distributors, or have a nipple, o end of which shall be brazed into the tubing, a the other end provided with male thread to scr into distributor.

Section 207. Iron or steel gas pipes shall installed in accordance with the following scale:

Diam. in inches	⅜	½	¾	1	1¼	1½	2	2½	3	3½
Length in feet	26	30	50	70	100	150	200	300	450	500
No. of burners	3	6	20	35	60	100	200	300	450	600

No riser or main pipe less than ¾ in. shall installed in any building without the approval the Superintendent.

Iron or steel gas pipes, arms, and the stems fixtures shall be of standard pipe and shall we according to the following table:

Diam in in.	⅛	¼	⅜	½	¾	1	1¼
Lb. per ft.	0.24	0.42	0.56	0.85	1.12	1.67	2.24

Diam in in.	1½	2	2½	3	3½	4
Lb. per ft.	2.68	3.61	5.74	7.54	9.0	10.66

Section 208. The service pipe must have connected to it, close to the foundation wall, an extra heavy malleable iron tee, and the end on the run opposite the service shall be reduced to ¾ in. and be plugged with a three-quarter nipple and cap. The outlet side shall have connected to it a close nipple and L with a main shut off cock made into the L. In buildings of more than one riser, each inlet riser should have connected to it in the cellar a shut-off the same size as the riser.

Piping installed in cold or damp places shall be properly dripped, painted with two coats of red lead and linseed oil, and protected in a manner satisfactory to the Superintendent.

Inside services shall be tested by the fitter who receives the permit to connect the service; connections for the meter must be installed, and the service connected when the test is made. This section applies to all inside services whether the meters are set in bathrooms or the basement.

Risers shall be run to within 5 ft. of that part of the foundation wall at which the service pipe will enter the building. The bottom of all risers shall have drip tees.

Section 209. Outlets for gas ranges shall have a diameter not less than that required for 6 burners except in buildings where gas is used for cooking and heating only, then the outlet shall be not less than ¾ in., and all ranges and heaters shall have

a tee handle cock on the service pipe. When several appliances are used from one supply pipe, the supply pipe must be provided with a shut-off to control all.

Drops and outlets less than ¾ in. shall not be left more than ¾ in. below plastering, centerpiece or woodwork; and other outlets shall not project more than ¾ in. beyond plaster or woodwork, and no outlets shall be placed back of doors, under tanks, or within 4 ft. of any meter.

All bracket outlets shall be at least 6 in. from window or door casings.

Alteration work and new fits in old buildings on each floor shall have no outlets except those that are supplied by the meter for that floor, and any outlet that may be connected to any other meter shall be disconnected and plugged under the floor or back of the plastering, and be covered up.

Section 210. Meters shall not be located nearer than 12 in. to any electric cutouts, switches, meters or other exposed live metal parts.

No meter shall be located in any room that is used as a sleeping room, or under stairways in any second or third-class building, or in closets unless they are properly ventilated at the upper part close to the ceiling, or in close proximity to any boiler or furnace, or directly over ranges.

No meter shall be set in any kitchen, kitchenette or any room containing a gas range unless the floor area is at least 36 sq. ft. and the meter can be set at least 8 ft. from any range or stove, and the room is properly ventilated.

There shall be a brass cock or valve according to size of fit, one at the inlet side and one at the outlet side of every meter. Iron valves shall not be used

When the meter sets near the service pipe, and not over 8 ft. of piping is used to connect the inlet side, the cock at the inlet may be left off, provided in all cases that the cock at the service tee can be readily reached.

Section 211. All cocks on illuminating fixtures that are installed in any building containing rooms used for sleeping purposes shall be separated one from the other at least 6 in.; and no hose cock or independent fitting, or any cock that controls the gas supply to any appliance, shall be nearer than 6 in. to any other cock.

Gas arc fixtures, inverted light fixtures, and all fixtures of this description, the burners of which are ignited from a pilot or several pilot lights, shall have in the stem of the fixture an extra heavy brass lever cock which can be operated from the floor, and if fixture is constructed with arms, the cocks on same must comply with rules as regards size and bearing; pilot light tubing shall be made gas tight.

Gas burners less than 2 ft. from plastered ceilings, or less than 3 ft. from overhead woodwork, shall be protected by a shield satisfactory to the Superintendent.

Stiff bracket fixtures should be installed in preference to swing brackets and no stiff bracket installed in any second or third-class building shall be less than 6 in. long, and, unless provided with a globe or a shade, shall have on the wall immediately back of it a suitable metal shield.

Swing brackets shall have a globe or guard to prevent the burner from coming in contact with the wall; no guard or ring to be less than 5 in. in diameter and the guard to be securely fastened to fixture independent of the burner.

Pendants and all one-burner fixtures shall not be smaller than ¼ in. iron size; if of brass it shall conform to the rule as regards the bore and gauge.

Top couplings on all brass stems shall be soldered or brazed to the stem, and the top couplings and insulating joints of all other fixtures shall be cemented and screwed on stem.

Fixtures shall be put together by heating and cementing, and be securely screwed into the drop so that it cannot be turned off by hand, and the arms made up so that they will remain safe and secure.

L-burner cocks shall not be used at the end of chandelier arms, except in stores, churches, theatres, halls, and places of assembly or public resort. All stems of fixtures of two lights or more each shall be not less than ¼ in. iron size.

Ranges and stoves shall be kept at least 8 in. from any woodwork or any lath and plastered partition, or protected to the satisfaction of the Superintendent.

All appliances of any description that can be connected to supply pipe with iron piping shall be so connected; the use of rubber tubing and flexible piping shall be allowed only when approved.

For all gas boilers for generating steam or in all automatic water heaters in which the burners are ignited automatically from a pilot light there shall be a ventilating pipe of cast-iron or of standard weight wrought iron or steel steam pipe to carry the gas to the open air.

This vent shall be carried in the open not less than 3 ft. before entering any wooden partition and if, within this length, it is nearer than 3 in. to any woodwork or wooden lathing they shall be protected by incombustible materials. If vent pipes

are installed for gas stoves they shall be arranged in the same way.

Ventilating pipes shall not have any damper, deflector or other device which will reduce the area of same and shall be not smaller than collar of the heaters to which they are attached.

Auxiliary water heater connected to hot water boilers, as set in kitchens in dwellings, shall have a supply pipe of not less than ½ in., but may be figured as 3 burners each.

Gas engines shall not be connected to a service from which gas for illuminating purposes is used. Exhaust pipes shall be run to roof when possible, shall not come in contact with woodwork, and shall be properly protected. Diaphragms and bags shall be on the same floor with engine and shall have a valve governing same.

The sizes of pipe used in connecting gas engines shall be approved by the Superintendent.

No patented device designed for the use of gas, and no improvement on any fixture, device, or appliance, or patent burners shall be installed in any building until the same has been approved by the Superintendent.

Section 212. All drop pipes shall have tee nipple and cap and shall be double fastened, and, when required by the Superintendent, this shall apply to piping done on the outside of plastering. Fastening boards shall not be cut away to accommodate electric wires.

Pipes shall be laid above the timbers and shall be run and laid to avoid any strain or weight on same, except that of fixtures, unless otherwise permitted by the Superintendent.

No gas pipe shall be laid within 6 in. of any

electric wire, unless the wire is in an insulate conduit or provided with a porcelain tube insulate

In installing and connecting pipes, fittings, fi tures, and appliances, the red lead, white lead, compound that is used must be applied to the m thread only.

The use of gas fitters' cement is prohibited e cept in putting fixtures together.

On concealed work no unions will be allowed, b right and left couplings shall be used. All unio shall be made up with ground metal seats.

Section 213. The gas fitter shall make a fi test in the presence of the Superintendent or h representative with a gauge made of glass tub of uniform interior diameter, and so construct that both surfaces of the mercury will be expos All fixtures and pipes must stand 2 in. of mercu for 5 minutes.

All ranges, stoves, and appliances shall be tes to the cocks or valves that control the burners.

Wherever spark lighting or self-lighting burn are used, the mercury test shall be applied to t cocks.

DIV. 29 ADDITIONAL FOR DWELLINGS

Section 214. No cellar shall be occupied for living purposes.

Section 215. The area of a window is the clear opening. Every window herein required shall be arranged so that approximately half its area may be opened at one time.

Every room, kitchenette, and alcove, except bath rooms and water closet compartments, shall have a window or windows of a total clear area of not less than 1/8 of the area of the room, so located as to light the room properly, opening upon a street, yard, or court located upon the same lot and of the dimensions specified in this division: *provided, however*, that this requirement shall not apply to rooms used for art galleries, swimming pools, gymnasiums, squash courts, or for similar purposes, nor to public rooms in multiple-dwellings, which have approved artificial ventilation. In multiple-dwellings, the top of at least one window in every room shall be not less than 7 ft. 6 in. above the floor.

Section 216. Every water-closet compartment and bathroom shall have at least one window opening directly upon the street, or upon a yard, court, or offset to court, of the dimensions specified for each in this division and located on the same lot. No such window shall be less in size than 3 sq. ft. and the aggregate area of windows for each water-closet compartment shall not be less than 6 sq. ft. A ventilating skylight not less in size than 3 sq. ft., open to the sky, may be used in lieu of windows required by this section. Nothing contained in this section shall be construed so as to prohibit a general toilet room containing several water-closet compartments separated from each other by dwarf partitions, *provided*, such toilet

room is adequately lighted and ventilated to the outer air as above provided.

Section 217. In two-family and multiple-dwellings there shall be in each apartment one room of not less than 150 sq. ft. area, and not more than one room besides kitchenettes and bathrooms, of less than 80 sq. ft. area, and no room less than 63 sq. ft. area.

No room, except kitchenettes, bathrooms, and water-closet compartments, shall be less than 7 ft. wide, nor shall its length be more than twice its width, the width being the dimension measured along a window wall. No room in a multiple-dwelling shall be less than 8 ft. 6 in. high.

There shall be access to every living room and bedroom and to at least one water-closet compartment without passing through a bedroom, bathroom, or water-closet compartment.

Section 218. Every public corridor extending more than 20 ft. from a stair hall shall have at least one window of not less than 12 sq. ft. area opening upon a street, a public alley or open passageway not less than 10 ft. wide, a yard, a court, an offset of a court, or a vent shaft, all of the dimensions required by this division, or, in lieu of such window, every door opening into such corridor shall have a wire glass panel of not less than 320 sq. in. area.

Sashes glazed with wire glass may be required by the Superintendent if, in his opinion, they are needed for the adequate lighting of any public corridor.

Section 219. Every public stair hall shall have at least one window on each floor of not less than 12 sq. ft. area opening upon a street, a public alley, an open passageway not less than 10 ft. wide, a court, an offset of a court, or a vent shaft, all of the dimensions required by this division: *provided, however*

that two stairways serving the same apartment shall not open into the same vent shaft and, *provided*, further, that no such windows shall be required when there shall be, within the space enclosed by the stairway and its landings, from the second story upward, an open area for light and ventilation whose least dimension shall be 3 ft. for a 3-story building and 1 ft. additional for each additional story, and with a skylight directly over the well with an area equal to the area of the well, but not less than 20 sq. ft. in any case. Such skylight shall have either ridge ventilators with a minimum opening of 40 sq. in. or shall have louvres giving a clear area of 40 sq. in.

Glazing at the entrance of at least 5 sq. ft. shall be considered adequate for the lighting of the entrance hall between the entrance and the stairs.

Section 220. Every dwelling shall have a basement, cellar, or excavated space under the entire entrance floor at least 3 ft. in depth, or shall be elevated above the ground so that there will be a clear space of at least 24 in. between the top of the ground and the bottom of the entrance floor so as to ensure ventilation and protection from dampness. Such space shall in all cases be enclosed, but provided with ample ventilation and properly drained. When necessary to make basement or cellar floors dry, waterproofing shall run through the walls and up the same as high as the ground level and shall be continued throughout the floor, and the said cellar or lowest floor shall be properly constructed so as to prevent dampness or water from entering. All cellars and basements in dwellings shall be properly lighted and ventilated.

Section 221. Within every dwelling and apartment there shall be a water-closet. Each such water-closet shall be placed in a compartment completely

separated from every other water-closet: such co partment shall be not less than 3 ft. wide, and sh be enclosed by partitions which shall extend from t floor to the ceiling. In multiple-dwellings such pa titions shall not be of wood or other absorbent mater and no wooden sheathing or wainscoting shall be pe mitted and the floor shall be made water-proof, a such water-proofing shall extend at least 2 in. above t floor.

Nothing in this section shall be construed so t to prohibit in any dwelling a general toilet roo containing several water-closet compartments sep rated from each other by dwarf partitions: *provid* such toilet room is adequately lighted and ventila to the satisfaction of the Superintendent, and th such water-closets are supplementary to the wate closet accommodations required by other provisio of this section. In multiple-dwellings every wate closet compartment shall be provided with prope means of lighting the same at night. No drip tra shall be permitted in any water-closet. No wate closet shall be placed out of doors. No water-clos shall be placed in the cellar of any multiple-dwell unless such closet is adequately ventilated and ligh by a window to the outer air.

Section 222. No multiple-dwelling shall be bu on any street unless there is a public sewer in su street or a private sewer connecting directly with public sewer.

Section 223. No plumbing fixtures shall be e closed with woodwork.

Section 224. In every dwelling there shall be proper sink or wash bowl with running water, e clusive of any sink in the cellar. In two-family dwe ings and in multiple-dwellings there shall be such

sink or wash bowl in each apartment, suite, or group of rooms.

Section 225. No dwelling of third class B construction shall hereafter be erected exceeding 2½ stories in height in any part, nor shall it be occupied by more than two families.

Dwellings of third-class A construction occupied by not more than three families, not exceeding three full stories or 50 feet in height above the curb, not over 2000 square feet area, and not less than 7 feet from each side lot line may be erected in Districts 2 and 3, *provided, however*, that one bay window, 12 feet or less in length, may project on each side of such a dwelling to not less than 5 feet from the side lot line. Such 3 story dwellings may be built of third-class A construction, but without the incombustible wall covering, *provided, however*, that no permit for such construction shall be granted unless there has been filed with the Superintendent, the written consent of seventy-five per cent. of the lots of real estate of which either 2500 square feet or one-third of the total area lie within 200 feet of the center of the lot on which the dwelling is proposed to be erected; each lot to be entitled to one vote on the question of consent. Such real estate shall include all land, public, institutional, or private, except highways.

No dwelling of second-class E construction shall be erected exceeding 4 stories in height and no dwelling of second-class B construction exceeding 5 stories, nor shall any multiple dwelling of second-class construction exceed 3000 square feet in area between fire walls, party walls and exterior walls. Every dwelling hereafter erected which exceeds 5 stories in height shall be of first-class construction.

Section 226. In two family dwellings two means

of egress satisfactory to the Superintendent shall
provided from the third story or half story. In
multiple dwellings a main stairway, accessible fro
each apartment, shall extend from the entrance flo
to the top floor. The stairs and landings shall be
least 3 feet 4 inches wide between faces of walls,
three feet between face of wall and face of balustrade
or between faces of two balustrades, and no winde
shall be allowed. In multiple dwellings exceeding tw
stories in height such stairway shall be construct
as specified in Division 20 and surrounded by
respective types of enclosure specified in Division
Such stairway shall not extend below the entra
floor. In multiple dwellings exceeding three stor
in height the entrance floor of such stairway sh
either be of first-class construction or, if the floor
of combustible construction, the enclosure walls sh
be continued to the basement or cellar floor witho
openings below the entrance floor.

In addition to the main stairway specified abo
there shall be a second way of egress from each apa
ment in multiple-dwellings without passing thro
the first way. Such second way of egress may be a
of the following the owner may elect.

In multiple dwellings not exceeding three stories
height such additional way of egress may be an o
side open stairway of wood with wooden balco
or piazzas, or an interior stairway which, if it exte
to the basement or cellar shall be surrounded in
basement by an enclosure of wooden studs covered
the side toward the basement of cellar with metal la
and cement plaster or with approved plaster boa
not less than ½ in. thick coated with at least ¼
of cement or gypsum plaster. Any doorway from ba
ment or cellar into such stairway shall be fitted w
approved self-closing fire door in metal or metal c

ered frame. Such interior stairway shall have stairs and landings at least three feet wide between faces of walls or two feet 8 inches between face of walls and face of balustrade or between faces of two balustrades, and winders will be permitted.

In multiple dwellings exceeding three stories in height such second way of egress may be any of the following the owner may elect.

(1) An interior stairway surrounded by the respective types of enclosure specified in Division 19 and constructed as specified in Division 20.

(2) Exterior metal or reinforced concrete fire escape, approved as to construction and access.

(3) A horizontal exit as specified in Division 20.

For multiple dwellings three stories high and with a flat roof, one stairway shall be extended to the roof by stairs or stationary ladder to a scuttle not less than two feet by three feet. For dwellings four stories or more high and with a flat roof, one stairway shall be extended to the roof by stairs through a bulkhead with door not less than 6 feet 8 inches high. No lock shall be placed on any bulkhead door or scuttle, but they may be fastened on the inside by movable bolts or hooks.

Portions of multiple-dwellings separated by fire or party walls may have a common entrance and stairway: Provided, that such stairway and entrance hall are surrounded by the respective types of enclosure specified in Division 19 and constructed as specified in Division 20.

Section 227. Entrance halls in multiple-dwellings shall be at least 3 ft. 6 in. wide in the clear, and shall be constructed and enclosed like the corresponding stairway.

Section 228. Public corridors in multiple-dwell-

ings shall be surrounded by enclosures like those spec
fied for stairways in Div. 19, and all doors fro
public corridors to apartments shall be approved sel
closing fire doors with metal or metal covered frame
and all windows from public corridors shall be a
proved fixed metal covered windows with wire gla

Section 229. In every multiple-dwelling there sha
be an entrance to the cellar or other lowest story fro
the outside.

Section 230. No garbage chute shall be erected
any dwelling.

DIVISION 30—EXISTING BUILDINGS, OTHER THAN DWELLINGS.

(For lining existing walls, see Div. 11.)

Section 231. Repairs as defined in this ordinance may be made without a permit.

Section 232. Alteration or addition in existing buildings shall be made to comply with the requirements of this ordinance for new buildings, and if the Superintendent decides that an alteration, when completed, will produce a practically new building or impair the stability or increase the fire risk of the building as a whole, then the whole building shall be made to conform to the requirements of this ordinance for a new building. A building damaged by fire or other casualty to an amount less than one-half of the cost of a like new building may be repaired or restored so as to conform to its original condition, or, may be reconstructed in some or all of its parts, as the Superintendent may specify in his permit.

No third-class building within district 1 shall be so altered or repaired as to increase the fire hazard, nor altered or repaired if the estimated cost of the proposed alterations or repairs exceeds one-half of the cost of a like new building. Changes in existing dwellings may be made to permit of their occupancy by not more than three families under such conditions as the Superintendent may require. This amendment shall become null and void on the first day of January, in the year Nineteen Hundred and Twenty-two.

Section 233. No third-class building shall be moved from without to within district 1, and no third-class building within district 1 shall be moved to any position away from the lot upon which it is built or to any position where the fire hazard would be increased.

Section 234. The Superintendent may prescribe the maximum loads which may be imposed upon the floors of existing buildings.

Section 235. In work in connection with alterations of existing buildings, the character and amount of protection of structural metal shall be, as far as reasonable, equivalent to that required for like buildings hereafter erected.

Section 236. No existing building shall be so altered or enlarged as to contain an unenclosed area greater than that allowed in Div. 18 of this ordinance for buildings hereafter erected.

Section 237. Every existing building shall have with reference to its height, condition, construction, surroundings, character of occupation, and number of occupants, reasonable means of egress in case of fire and for this purpose the Superintendent may require that exits, corridors, and stairs to be, as far as reasonable, equivalent to those required for like buildings hereafter erected.

Section 238. The Superintendent may require in existing buildings, fire doors, windows, and shutters as far as reasonable equivalent to those required in like buildings hereafter erected or otherwise so as to secure an equivalent degree of fire protection.

Section 239. Alterations required in existing buildings shall be made within 6 months after the written notice of such requirements.

DIVISION 31.—EXISTING DWELLINGS.

Section 240. Excepting water-closet compartments and bathrooms, wherever a room in any existing two-family or multiple-dwelling has window area of less than 9 sq. ft. opening on a yard, court, alley, or open passageway, all of which are not less than 10 ft. wide, or upon a street, railroad right of way, cemetery, public park, or above the roof of an adjoining building, such window or windows shall be enlarged and provided with the above area, unless such room is located on the top floor and is adequately lighted and ventilated by a skylight opening directly to the outer air. Wherever a room has no windows at all to the outer air or has only a window opening upon a yard, alley or open passageway less than 10 ft. in width or upon a shaft or court less than 6 ft. in its least dimension such a room may be occupied if provided with a double-hung window or windows of not less than 15 sq. ft. total area, opening into an adjoining room in the same apartment having a window or windows of a total clear area of not less than ⅛ of the area of the room and opening upon such a yard, court, alley, or open pasageway, all of which are not less than 10 ft. wide or upon a street, railroad right of way, cemetery, public park, or above the roof of an adjoining building. Such windows shall be glazed with translucent glass in the lower half, and, as far as possible, shall be in line with windows in the outer room.

One wall of every alcove in an existing two-family or multiple-dwelling shall be provided with an opening equal in area to at least 60% of the separating partition, and no door shall be allowed to close such opening.

No existing two-family or multiple-dwelling shall be altered as to reduce the provisions for light and

ventilation of any room, alcove, public corridor, or st
hall below the requirements of this ordinance.

Section 241. When the public corridor in an ex
ing multiple-dwelling extends more than 20 ft. fro
stair hall and is not provided with windows opening
provided in Sec. 218, all doors leading from such pu
lic corridor into apartments shall be provided with w
glass panes of not less than 4 sq. ft. for each door.

Section 242. In every existing multiple-dwel
over three stories high there shall be in the roof,
rectly over each stair hall, a skylight of not less tha
sq. ft. area with a ventilator or louvres giving a cl
area of at least 40 sq. in.: *provided, however*, that t
section shall not apply to any existing multiple-dw
ings, having windows as provided in Sec. 219
bulkhead in the roof over the stairs, which bulkhea
provided with a window or windows, made so as to o
readily, and of not less than 12 sq. ft. total area

Section 243. In all existing multiple-dwellings
woodwork enclosing the space underneath all wa
closets used in common by two or more families s
be removed, and the space underneath the seat sha
left open. The floor and other surface beneath
around the closet shall be put in good order and re

Section 244. The floor of the cellar or lowest
of every dwelling shall be free from dampness,
when deemed necessary and ordered by the Supe
tendent, shall be concreted with not less than 3 i
concrete of good quality and with a finished surface

In every existing multiple-dwelling which is
than 3 stories in height and having more than 8 a
ments, all stairways, elevators, vent shafts, and
shaftways or chutes shall be enclosed in the base
as provided in Div. 19.

Section 245. In every existing multiple-dwelling where there is a court or shaft of any kind, there shall be at the bottom of every such shaft and court a door or window giving sufficient access to such shaft or court to enable it to be properly cleaned out.

Section 246. Every existing multiple-dwelling exceeding one story in height shall have at least two independent ways of egress accessible from each apartment constructed and arranged to the satisfaction of the Superintendent.

All existing fire-escapes which do not conform to the requirements of Sec. 226 may be altered by the owner to make them conform in lieu of providing new fire-escapes, but no existing fire-escape shall be extended or have its location changed except with the approval of the Superintendent. All fire-escapes hereafter erected on any existing multiple-dwelling shall be located and constructed as prescribed in Sec. 226 of this ordinance.

Section 247. Every existing flat-roofed multiple-dwelling exceeding two stories in height shall have in the roof a bulkhead or a scuttle with stairs or stationary ladder giving access thereto to the satisfaction of the Superintendent and all key locks on scuttles or bulkhead doors shall be removed.

Section 248. No garbage chute shall be erected in any existing dwelling.

DIVISION 32.—MAINTENANCE AND OCCUPANCY.

For permits for certain classes of buildings see D partment of Public Safety regulations.

OCCUPANCY PERMITS

Section 249. It shall be unlawful to use or per the use of any building or premises or part there hereinafter created, erected, changed or conver wholly or partly in its use or structure, except priv and two-family dwellings, until a permit for occupa to the effect that the building or premises or the p thereof so created, erected, changed or converted a the proposed use thereof conform to the provisions this ordinance shall have been issued by the Super tendent. In the case of such buildings or premise shall be the duty of the Superintendent to issue a p mit for occupancy within ten days after a request the same shall be filed in his office by any owner building or premises affected by this ordinance, p vided said building or premises, or the part thereof created, erected, changed or converted, and the propo use thereof, conforms with all the requirements her set forth. Upon written request from the owner, Superintendent shall issue a permit for occupancy any building or premises existing at the time of passage of this resolution certifying after inspec the use of the building or premises and whether s use conforms to the provisions of this ordinance. P mits shall remain in force until revoked, altered or n void as herein provided.

Section 250. Pending the issuance of a regular p mit, a temporary permit may be issued for such per

not exceeding 6 months, as the Superintendent may designate, during the completion of alterations required by him in accordance with the provisions of this ordinance, or during partial occupancy of a building pending its completion. Such temporary permits shall be issued under such restrictions and provisions as the Superintendent may order for the safety of the occupants. No temporary permit shall be issued if, in the opinion of the Superintendent, the building fails to conform to the provisions of this ordinance or regulations issued under it to such a degree as to render it unsafe for the occupancy proposed.

Section 251. A permit issued as herein provided shall be conclusive evidence of compliance with the provision of this ordinance, its regulations, and other ordinances having effect at the time of its issuance, subject only to its being made void by act or neglect of the owner as herein provided.

Section 252. If the conditions of use or occupancy of any building or part thereof are substantially changed, or so changed as not to be in conformity with the conditions required by a permit issued therefor, said permit shall be void and the owner shall notify the Superintendent who shall order an inspection of the building. The owner shall make the building conform to the requirements of this ordinance for such new use or occupancy as directed by the Superintendent and a new permit shall thereupon be issued as herein provided.

If, on any inspection, the conditions of a building or its use or occupancy are found not to conform to the requirements of this ordinance or the conditions of an existing permit therefor, the Superintendent shall at once issue written notice to

the owner, specifying the manner in which th building fails to so conform, and the owner sha at once take steps to make it so conform, as directe by the Superintendent; and if the Superintende deems it necessary for the proper protection of th occupants he may order the use or the occupanc of the building modified or the building vacate until its condition is made satisfactory in conform ity with this ordinance, at which time a permit sha be issued as herein provided.

Section 253. Nothing herein contained shall re quire any change in the plans or construction or des nated use of a building for which a building perm has been heretofore issued, or plans for which are file with the Superintendent of Buildings at the tim of the passage of this ordinance, and a permit for th erection of which is issued within two months of th passage of this ordinance, and the construction which, in either case, shall have been diligently pro ecuted within six months of the date of such permi and the ground story framework of which, includi the second tier of beams, shall have been comple according to such plans, as filed within two years fro the date of the passage of this ordinance.

Nothing in this ordinance shall prevent the restor tion of a wall declared unsafe by the Superintende

Section 254. The invalidity of any section or pr vision of this ordinance shall not invalidate any ot section or provision hereof.

Section 255. This ordinance shall take effect its passage.

In City Council Dec. 31, 1923.

Passed to be ordained.

JAMES T. BARRETT,
President.

EXECUTIVE DEPARTMENT

Jan. 7, 1924.

Approved: EDWARD W. QUINN,
Mayor.

A true copy,

Attest:—

FREDERICK H. BURKE,
City Clerk.

INDEX OF DIVISIONS

Note:—The sections of the Building Code that in effect may be called the Zoning Law are as follows:—Divisions 3, 4, 5 and 6, Sections 10 to 35 inclusive.

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Office Supreme Court, U. S.
FILED
APR 11 1928
CHARLES ELMORE CROPLEY
CLERK

Supreme Court of the United States.

October Term, 1927.

No. 509.

SAUL M. NECTOW,
PLAINTIFF IN ERROR,

v.

CITY OF CAMBRIDGE AND JEREMIAH F. DOWNEY, INSPECTOR OF BUILDINGS OF THE CITY OF CAMBRIDGE.

In Error to the Supreme Judicial Court of the State of Massachusetts.

BRIEF FOR PLAINTIFF IN ERROR.

JOHN E. HANNIGAN,
Attorney for Plaintiff in Error.

ADDISON C. GUTCHELL & SON, LAW PRINTERS, BOSTON.

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Supreme Court of the United States.

OCTOBER TERM, 1927.

No. 509.

SAUL M. NECTOW,
PLAINTIFF IN ERROR,
v.
CITY OF CAMBRIDGE AND JEREMIAH F. DOWNEY,
INSPECTOR OF BUILDINGS OF THE CITY OF CAMBRIDGE.

IN ERROR TO THE SUPREME JUDICIAL COURT OF THE STATE OF MASSACHUSETTS.

BRIEF OF PLAINTIFF IN ERROR.

STATEMENT OF THE CASE.

This is a bill in equity filed in the Supreme Judicial Court of Massachusetts, praying for relief from a zoning ordinance because in its specific application to plaintiff's property it violated his constitutional state and federal rights, and setting forth at length facts which may be summarized as follows:

The plaintiff in error, to be called the plaintiff, owns a tract of land 300 feet front and 100 feet deep in Cambridge, Massachusetts, which before December 31, 1923, was of the value of $50,000 or more. On that day the City Council, being the governing body, of Cambridge, by virtue of authority granted by the state enacted a zoning ordinance covering the whole city, which so restricted the uses to be made of plaintiff's land as to destroy any and all inherent

value in the land; that this restriction was irrational and hence unjust because the only uses to which under the ordinance it can be lawfully put are the only uses to which no rational person would ever put it, and the uses to which it may not be put are those uses for which it is specially adapted and needed; and that the zone classification of the property has no tendency to promote the general purposes for which only zoning inhibitions may lawfully be applied. Under the ordinance the land is to be limited to dwelling-houses, but no citizen would now think of making a home on it. In ancient days a famous man's house stood there but the house and the days are gone. The site now rests under the shadow of one of Mr. Ford's massive assembling plants, which stands on the south of it. The site also forms the western apex of Cambridge's great industrial district, through which, not far off, runs a busy freight line of the New York Central Railroad. On the remaining two sides substantial industrial traffic flows on two streets. This traffic must increase. The ordinance detaches the locus from the thriving mainland, of which characteristically it is part and parcel, and makes it a desert island "inaccessible to man."

In fact the city, prior to this zoning, was faced with the necessity of widening this street, which could be done only by taking a strip of plaintiff's land.

Upon issues joined the case was referred to a master, who, after hearings, made a full report. This report was confirmed by the Court. Its findings substantiate the essential allegations of the bill. Reference is made to the following pages of the record for controlling facts established by the report:

Page 22, paragraphs 6, 7, 8, for description of locus and surroundings.

Page 22, paragraphs 10, 11, 12, 13, for further description and reference to a contract of sale pending at the time of the enactment.

Page 24, paragraph 14, further reference to contract.

Page 24, paragraph 18, terms of ordinance.

Page 25, paragraph 22, impracticability of use of land for apartment houses.

Page 26, paragraph 25, substantial vehicular traffic; paragraph 26, failure of sale.

Page 28 relates to the street widening.

Page 29, paragraph 38, description of adjoining Ford factory; paragraph 39, freight railroad and industrial neighborhood.

Page 30, paragraph 40, history of neighborhood.

> "The plaintiff's land is close to this business area as heretofore described and it is difficult if not impossible to differentiate the material and dominant characteristics of the Ford property and the plaintiff's other land adjoining on the East from those of the plaintiff's land in question."

Page 30, paragraph 40, further history of neighborhood and use of streets; paragraph 41, existing residence district; paragraphs 42, 43, values and dwellings; no children and no schools in neighborhood; fire hazard greater for dwelling-houses than mercantile buildings.

Page 31, paragraph 48:

> "I am satisfied and I find as a fact that no practical use can be made of the land in question for residential purposes, because among other reasons herein related, there would not be adequate return on the amount of any investment for the development of the property."

Page 32, paragraph 49, the soap factory.

Page 33, paragraph 57:

> "I am satisfied that the districting of the plaintiff's land in a residence district would not promote the health, safety, convenience and general welfare of the inhabitants of that part of the defendant city, taking

into account the natural development thereof and the character of the district and the resulting benefit to accrue to the whole city and I so find."

The master also found that the market value of the property now is $8000. As no rational use can be made of the property this value manifestly refers to the amount speculators might give for the land, anticipating that such an ordinance will some day be lifted. No one would pay rent sufficient to justify building, even if the land were given free.

The Supreme Judicial Court of Massachusetts decided, upon the facts as reported, that the plaintiff had made out no case for relief.

The federal question was duly saved in the presentation to the state Court (Opinion, page 41).

The errors relied on are as follows:

The zoning ordinance in question is in its specific application to the property of the plaintiff in error unconstitutional in that—

(*a*) It deprives the plaintiff of his property without due process of law;

(*b*) It denies to the plaintiff equal protection of the laws;

(*c*) It deprives the plaintiff of his property without just compensation therefor; all in violation of the 14th Amendment to the Constitution of the United States of America.

Statute under which City Council Acted.

G.L. c. 40, sec. 25:

"Section 25. A city or town may by ordinance or by-law restrict buildings to be used for particular industries, trades, manufacturing or commercial purposes to specified parts of the city or town, or may

exclude them from specified parts of the city or town, or may provide that such buildings, if situated in certain parts of the city or town, shall be subject to special regulations as to their construction or use. A city or town may also by ordinance or by-law provide that certain kinds of dwelling houses and tenement houses shall be restricted to specified parts of the city or town, or shall be excluded from specified parts of the city or town, or that dwelling houses or tenement houses situated in specified parts of the city or town shall conform to certain regulations in respect to their construction or use which do not apply to such buildings in other parts of the city or town. For the above purpose the city or town may be divided into districts or zones, and the construction and use of buildings in each district or zone may be regulated as above provided. The provisions of this section shall be carried out in such manner as will best promote the health, safety, convenience and welfare of the inhabitants, will lessen the danger from fire, will tend to improve and beautify the city or town, will harmonize with its natural development, and will assist the carrying out of any scheme for municipal improvements put forth by any municipal planning board or board of survey or other like authority. Due regard shall be paid to the characteristics of the different parts of the city or town, and the ordinances or by-laws established hereunder in any city or town shall be the same for zones, districts or streets having substantially the same character."

Points and Authorities.

The case of *Euclid* v. *Ambler Realty Co.*, November 22, 1926, is not germane. That was a general attack upon an ordinance as a whole. This case makes no such attack.

The plaintiff invokes the doctrine applied in *Pennsylvania Coal Co.* v. *Mahon*, 260 U.S. 393, where the Court said:

> "As long recognized, some values are enjoyed under an implied limitation and must yield to police power. But obviously the implied limitation must have its limits or the contract and due process clauses are gone. One fact for consideration in determining such limits is the extent of the diminution. When it reaches a certain magnitude, in most if not in all cases there must be an exercise of eminent domain and compensation to sustain the act. So the question depends upon the particular facts.
>
> "It is our opinion that the act cannot be sustained as an exercise of the police power, so far as it affects the mining of coal under streets or cities in places where the right to mine such coal has been reserved. As said in a Pennsylvania case: 'For practical purposes, the right to coal consists in the right to mine it.' Com. ex rel. Keator v. Clearview Coal Co. 256 Pa. 328, 331, L.R.A. 1917 E, 672, 100 Atl. 820. What makes the right to mine coal valuable is that it can be exercised with profit. To make it commercially impracticable to mine certain coal has very nearly the same effect for constitutional purposes as appropriating or destroying it. This we think that we are warranted in assuming that the statute does. . . . The protection of private property in the 5th Amendment presupposes that it is wanted for public use, but provides that it shall not be taken for such use without compensation. A similar assumption is made in the decisions upon the 14th Amendment. Hairston v. Danville & W. R. Co. 208 U.S. 598, 605, 52 L. ed. 637, 639, 28 Sup. Ct. Rep. 331 13 Ann. Cas. 1008. When this seemingly absolute protection is found to be qualified by the police power, the natural tendency of human nature is to extend the

qualification more and more until at last private property disappears. But that cannot be accomplished in this way under the Constitution of the United States."

It is believed that the instant case presents a question not passed upon by the Court: An ordinance valid in its general application falls upon a small owner with such disastrous effect that he is deprived of all practical use of his property, while his neighbors, in actual result, are aggrandized by the free gift of an open area or park. In the Ambler case the land in question could be used at least for desirable dwelling-houses. In the instant case the barren result was to have been clearly foreseeable.

In the light of the findings, which cannot be overridden, the language of the ordinance means the same thing as if it said:

"No buildings of any sort shall be erected upon the land of Saul Nectow lying between Henry Street and the Ford factory, 100 feet back from Brookline Street, but said land shall be kept vacant."

This Court has not felt itself bound by a state Court's construction of an ordinance in an analogous case in which the 14th Amendment was involved, and in which the protection sought by this plaintiff was granted to that plaintiff.

See *Yick Wo* v. *Hopkins*, 118 U.S. 356.

There is a limit beyond which police power cannot go. That limit vaguely may be called regulation. In plaintiff's case there was no regulation; there was only a taking under a plausible regulation.

Loehner v. *New York*, 198 U.S. 45.

It cannot be without significance that when this ordinance was passed and plaintiff's land was inhibited the state

legislature had ordered the making by the city of a new bridge, and that obedience to this mandate would necessitate a taking of some of plaintiff's zoned land for street widening.

Dobbins v. *Los Angeles*, 195 U.S. 223.
See also *Isenbarth* v. *Bartnett*, 206 App. Div. N.Y. 546.

If a state may not, under the guise of passing a law in the public interest, arbitrarily impose unreasonable and unnecessary restraint upon lawful business or occupation, no more may a state authorize a city to impose unnecessary restraint upon the lawful and wholesome use of property.

Burns Baking Co. v. *Bryan*, 264 U.S. 813.

Zoning laws are justified mainly because they make for better homes. The application of this ordinance to plaintiff's land was a prostitution of the zoning principle. It provided an unwholesome and unsuitable place for dwellings.

Adams v. *Tanner*, 244 U.S. 590.
Wyeth v. *Cambridge*, 200 Mass. 474.

The burden of the improvement of the neighborhood by the addition of another open space was placed entirely upon the plaintiff, with no reciprocity.

2 Cooley on Taxation (3d ed.), 1255, 1256.
Norwood v. *Baker*, 172 U.S. 269, 279.
Butters v. *Oakland*, 263 U.S. 162, 166.
Browning v. *Hooper*, June 4, 1926.

Respectfully submitted,
JOHN E. HANNIGAN,
Attorney for Plaintiff in Error.

(9)

Office Supreme Court, U. S.
FILED
MAR 31 1928
CHARLES ELMORE CROPLEY
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Supreme Court of the United States.

October Term, 1927.

No. 509.

SAUL M. NECTOW,
PLAINTIFF IN ERROR,

v.

CITY OF CAMBRIDGE AND JEREMIAH F. DOWNEY, INSPECTOR OF BUILDINGS OF THE CITY OF CAMBRIDGE.

In Error to the Supreme Judicial Court of the State of Massachusetts.

BRIEF FOR RESPONDENTS.

PETER J. NELLIGAN,
J. EDWARD NALLY,
JOSEPH P. LYONS.

ALFRED C. SUTCLIFFE & SON, LAW PRINTERS, BOSTON.

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Supreme Court of the United States.

OCTOBER TERM, 1927.

No. 509.

SAUL M. NECTOW,
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v.
CITY OF CAMBRIDGE AND JEREMIAH F. DOWNEY, INSPECTOR OF BUILDINGS OF THE CITY OF CAMBRIDGE.

IN ERROR TO THE SUPREME JUDICIAL COURT OF THE STATE OF MASSACHUSETTS.

RESPONDENTS' BRIEF.

STATEMENT OF THE CASE.

This is a bill filed the 31st day of December, 1924, for a mandatory injunction to direct the defendant city and its Inspector of Buildings to consider and pass upon an application of the plaintiff for a permit to erect a building or buildings on the tract of land situated at the corner of Brookline and Henry Streets in Cambridge; also to allow the plaintiff to erect any lawful building upon said tract of land regardless of the provisions of a certain ordinance of said city; and that said ordinance be held to be invalid in its specific application to the plaintiff's land.

The ordinance in question was passed on December 31, 1923, and approved by the Mayor on January 7, 1924. Later it was validated by chapter 87 of the Acts of 1925.

The provisions of the ordinance divided the city into three districts: residential, business, and unrestricted. The petitioner's land in question was placed in district R-3, in which are permitted to be erected dwellings, hotels, clubs, churches, schools, philanthropic institutions, greenhouses, and gardening, with customary incidental uses, including garage for not more than two cars. Four-story buildings or buildings 60 feet in height are permitted.

The following uses are expressly prohibited in said residential district: "Business and industry of all sorts. Buildings of five or more stories or over sixty feet in height." Buildings must be set back 5 feet and be at least 25 feet from the center of any street.

In August, 1924, under the provisions of chapter 40, section 27, of the General Laws, and chapter 133 of the Acts of 1924, the plaintiff petitioned the Board of Appeals to vary the application of said ordinance so as to permit the plaintiff to erect a business building on said locus, or, in other words, to take the locus in question out of the residential zone. After a hearing the Board refused to grant the petitioner's request.

The locus in question contains 29,000 square feet of land, and is part of a large tract containing 140,000 square feet of land which was also owned by the plaintiff at time of the passage of said ordinance.

The locus in question has always been used for residential purposes, and, at the time of the passage of the ordinance, there was a dwelling-house located thereon. Part of the remaining land of the plaintiff to the east of the locus had been occupied by a mansion-house, which has since been removed.

The locus is situated at the corner of Brookline and Henry Streets in Cambridge. It has a frontage on Brookline Street of 304.75 feet and on Henry Street, 100 feet. Directly across Brookline Street to the west and across Henry Street to the north is a thickly settled residential

district with but a small amount of land available for more residences. Diagonally across Brookline Street on the opposite corner from the locus is situated a city park containing 30,000 square feet of land. A short distance from the locus to the south is situated the river parkway, called "Memorial Drive," under the control of the Metropolitan District Commission.

This case came on to be heard before a single justice upon objections to the master's report. The Court ordered a decree to be entered overruling the objections and confirming the master's report, and reported the case for the determination of the Full Court.

This case came on to be heard before the Full Bench upon the report from the single justice. The Court ordered that the bill be dismissed.

Argument.

Upon the pleadings and master's report the plaintiff is not entitled to relief.

1. The master does not find any unreasonable or arbitrary use of power or abuse of discretion on the part of the City Council in passing the aforesaid zoning ordinance.

> *Reinman* v. *Little Rock*, 237 U.S. 171, at page 177: "While such regulations are subject to judicial scrutiny upon fundamental grounds, yet a considerable latitude of discretion must be accorded to the law-making power; and so long as the regulation in question is not shown to be clearly unreasonable and arbitrary, and operates uniformly upon all persons similarly situated in the particular district, the district itself not appearing to have been arbitrarily selected, it cannot be judicially declared that there is a deprivation of property without due process of law, or a denial of the equal protection of the laws, within the meaning of the 14th Amendment."

In *Albion* v. *Toledo*, 124 N.E. 237, cited in 6 A.L.R. 426, at page 429, the Court says: "Unless there is a clear and palpable abuse of power the court will not substitute its judgment for legislative discretion. The local authorities acquainted with local conditions are presumed to know what the needs of the community demand. . . ."

"Local legislative authorities, and not the courts, are primarily the judges of the necessities of local situations calling for police regulation, and the courts can only interfere when such regulation arbitrarily exceeds a reasonable exercise of authority."

In *Jardine* v. *Pasadena*, 248 Pac. 225, cited in 48 A.L.R. 509, at page 515, the Court says: "Every intendment is to be indulged in and all doubts resolved in favor of the validity of its action. The legislative determination of the facts which warrant the action of the legislative body will not be set aside or disregarded by the court unless the legislative discretion is clearly and palpably wrong and such appears to be and is found to be the fact from the evidence educed from the trial court."

2. The ordinance will be sustained in its application to the plaintiff's land if it tends to promote the health, safety, convenience, and general welfare of the inhabitants.

(*a*) The master finds that the changing of the locus in question to a business zone would tend to increase to a small extent the amount of commercial traffic in Brookline Street (see section 54 of Master's Report), and, as traffic in this street will increase (see section 25 of Master's Report), this will tend to cause congestion, especially if Brookline Street is widened and used as an artery for traffic when the new Brookline Street bridge is built. If the placing of the plaintiff's land in R-3 district would tend to

relieve congestion of traffic in Brookline Street, this in itself would be sufficient justification for such zoning of the plaintiff's land.

Zahn and Ross v. *Board of Public Works for the City of Los Angeles*, 195 Cal. Rep. 497. In this case the Court said: "The requirements of a traffic boulevard are that traffic shall be kept moving, whereas it is common knowledge that on business streets traffic is retarded. This naturally arises from the necessity of stopping and parking on business streets."

Cusack Co. v. *City of Chicago*, 242 U.S. 526, at pages 530 and 531: "We therefore content ourselves with saying that while this court has refrained from any attempt to define with precision the limits of the police power, yet its disposition is to favor the validity of laws relating to matters completely within the territory of the state enacting them and it so reluctantly disagrees with the local legislative authority, primarily the judge of public welfare, especially when its action is approved by the highest court of the state whose people are directly concerned, that it will interfere with the action only when it is plain and palpable that it has no real or substantial relation to the public health, safety, morals or to the general welfare."

3. The preservation of the residential district to the west and north of the locus from the intrusion of business uses and incongruous commercial buildings is sufficient justification for the placing of the plaintiff's land in a residential zone.

In *Miller* v. *Board of Public Works of the City of Los Angeles*, 195 Cal. Rep. 477, the Court says: "We think it may be safely and sensibly said that justification for residential zoning may, in the last analysis, be

vested upon the protection of the civic and social values of the American home, and the establishment of such districts is for the general welfare because it tends to promote and perpetuate the American home. It is axiomatic that the welfare, and indeed the very existence of the nation depends upon the character and caliber of its citizenry. The character and quality of manhood and womanhood are in a large measure the result of home environment. The home and its intrinsic influence are the very foundation of good citizenship and any factor contributing to the establishment of homes and the fostering of home life doubtless tends to the enhancement not only of community life but to the life of the nation as a whole."

While the above was spoken of the establishment of residential zones, it applies with equal force to the preserving of these zones once established.

(*a*) The intrusion of mercantile buildings into this residential district adjacent to the locus in question would tend to mar the beauty of the locality as a residential district, and the zoning of the plaintiff's land to prevent this, as auxiliary to other reasons, would be justification for such zoning.

Welch v. *Swasey*, 193 Mass. 364; 214 U.S. 91. 105, 106.

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In *Wulfsolin* v. *Burden*, ~~284~~ N.Y. 288; 43 A.L.R. 651, at page 659, the Court says: "With few exceptions courts have not been ready to say that they might be sustained merely because they preserved the esthetic appearance of a private residential district and prevented it from being blotched by the erection of some incongruous structure whereby the value of all neighboring property was impaired. The Supreme Court of the United States has, however, gone so far as to

approve in substance the views of the Massachusetts Supreme Court that esthetic considerations might be considered as auxiliary of what thus far have been regarded by the courts as more effective and sufficient reasons."

4. The action of the city government in placing the plaintiff's land in a residential district was a reasonable use of its discretion.

In *Stillman* v. *Lynch*, 192 Pac. 272; 12 A.L.R. 552, at page 561, the Court says: "Every doubt as to the constitutionality of a statute must first be resolved in favor of its validity and that before a statute can be declared invalid the repugnancy between the statute and the Constitution must be entirely clear. . . . Every presumption is in favor of the constitutionality of a statute, and in case of a doubt the statute must be held to be valid."

In the case of *Inspector of Buildings of Lowell* v. *Stoklosa*, 250 Mass. 52, at page 62, the Court makes the following quotation from *Dobbins* v. *Los Angeles*, 195 U.S. 223: "It may be admitted that every intendment is to be made in favor of the exercise of the lawfulness of municipal power, making regulations to promote the public health and safety, and it is not the province of the courts, except in clear cases, to interfere with the exercise of the power reposed by law in municipal corporations for the protection of local rights and the health and welfare of the people in the community."

It was necessary for the City Council to draw a line of demarcation between the thickly settled district lying to the west, northwest, and north of the plaintiff's land and

the mercantile district lying to the south, southeast, and east of the plaintiff's land.

Reinman v. *Little Rock*, 237 U.S. 171, *supra*.
Village of Euclid v. *Ambler Realty Co.*, 272 U.S. 365, 388.

It would appear reasonable that the City Council should draw this line through the plaintiff's land so as to preserve the residential character of Brookline Street north of the Ford factory and the residential character of Henry Street along the frontage of the locus upon said street.

In *Zahn and Ross* v. *Board of Public Works of the City of Los Angeles*, *supra*, the Court said: "The mere fact that outside of the . . . district there was other property similar in nature and character would not justify the court upon ascertaining that fact to substitute its judgment for the legislative judgment. The boundary line of a district must always be more or less arbitrary, for the property on one side of the line cannot in the nature of things be very different from that immediately on the other side of the locus."

The fact that the inclusion of the petitioner's property in R-3 district rather than in a business zone depreciates its value is not of controlling significance. Every exercise of the police power is apt to affect adversely the property interest of somebody.

Spector v. *Building Inspector of Milton*, 250 Mass. 63.

In *Kansas City* v. *Fred Liebi*, 252 S.W. 404, cited in 28 A.L.R. 295, 299, at page 300, the Court says: "Nor does the mere fact that the advantage of a public improvement also inures to a particular individual or group of individuals deprive it of its public character."

In *Miller et al.* v. *Board of Public Works of the City of Los Angeles*, 234 Pac. 381, the Court says: "Somewhere the line of demarcation must be drawn, and it is primarily the province of the municipal body to which the zoning function is committed to draw that line of demarcation, and it is neither the province nor the duty of the courts to interfere with the discretion with which such bodies are invested, in the absence of a clear showing of an abuse of that discretion. In short, as previously indicated, we are not permitted to substitute our judgment for the legislative judgment."

5. The plaintiff in this case has suffered no greater disadvantage than may be suffered by any person whose land is on the border line between a business and a residential district.

Although the master finds that the plaintiff's land is depreciated in value and unsuitable for residential purposes, such finding is based entirely upon the assumption that the locus can be considered only by itself. The fact, however, that the plaintiff owns a large tract of land to the east of and contiguous to the locus in question gives him greater opportunities for the development of the tract consistent with the ordinance. The petitioner, by his ownership and control of the land contiguous to the locus in question, can protect the locus from the encroachment of undesirable mercantile establishments.

Whereas, if the ordinance as applied to the plaintiff's land is nullified by the Court, the owners of residential property on Brookline Street and Henry Street opposite the plaintiff's land would have no means of protecting their property from damages caused by the erection of such commercial or manufacturing buildings as the plaintiff may see fit to construct.

Village of Euclid v. *Ambler Realty Co., supra.*

6. There is no finding by the master that the locus in question, taken with the adjoining land of the plaintiff, could not be used profitably for residential or other purposes.

Jardine v. *Pasadena,* 248 Pac. 225, cited in 48 A.L.R. 509, 513.

7. If relief is granted to the plaintiff under the facts found by the master, it would be difficult to deny relief to any person bordering on the line of demarcation between a business and residential district, as the same arguments which the plaintiff uses would be applicable to them, and, moreover, certain parts of the plaintiff's land are farther removed from the land now occupied by commercial buildings than are some of the residences on Brookline Street and Henry Street.

8. The plaintiff had a valid contract for the sale of this locus in question with the Pittsburgh Plate Glass Company, a financially responsible corporation (see Master's Report, section 26), and it has an adequate remedy at law for the failure of said company to carry out its contract.

9. In case Brookline Street is widened by the City of Cambridge under the power of eminent domain, and the depth of the plaintiff's land is decreased, the plaintiff has his remedy for such action as provided by statute.

10. The plaintiff has failed to show any specific violation of the Constitution of the United States or the State of Massachusetts. There is no violation of the 14th Amendment, either by deprivation of property without due process, or by denial to the plaintiff of equal protection of the law. In the case at bar, the ordinance of the City of Cambridge, later supplemented by statute, places this case in the category of "police powers." Since there has not been shown any abuse of discretion, or palpable wrong done, the question resolves itself to one of reasonableness. Accordingly, the Court should not substitute its opinion

as to wisdom or good policy for that of the Legislature or City Council.

Cusack Co. v. *City of Chicago*, 242 U.S. 526, 530, 531, *supra.*
Reinman v. *Little Rock*, 237 U.S. 171, 177, *supra.*

In *Welch* v. *Swasey*, 214 U.S. 91, 105, 106, the Court says: "This court, in cases of this kind, feels the greatest reluctance in interfering with the well considered judgment of the courts of a state, whose people are to be affected by the operation of the law. The highest court of the state in which statutes of the kind under consideration are passed is more familiar with the particular causes which led to their passage (although they may be of a public nature), and with the general situation surrounding the subject matter of the legislation than this court can possibly be. We do not, of course, intend to say that under such circumstances the judgment of the state court upon the question will be regarded as conclusive, but simply that it is entitled to the very greatest respect, and will only be interfered with, in cases of this kind, where the decision is, in our judgment, plainly wrong."

In *Village of Euclid* v. *Ambler Realty Co.*, 272 U.S. 365, at page 388, the Court says: "If the validity of the legislative classification for zoning purposes be fairly debatable, the legislative judgment must be allowed to control. . . ."

"Here the exclusion is in general terms of all industrial establishments. . . . But this is no more than happens in respect of many practice-forbidding laws which this court has upheld although drawn in general terms so as to include individual cases that may turn out to be innocuous in themselves. . . ."

"In the light of these considerations, we are not prepared to say that the end in view was not sufficient to justify the general rule of the ordinance, although some industries of an innocent character might fall within the prescribed class. It cannot be said that the ordinance in this respect 'passes the bounds of reason—assumes the character of a merely arbitrary fiat'. . . ."

"The great question involves the validity of zoning legislation . . . with residential districts . . . excluding stores, hotels, apartment houses, etc. . . . Decisions of state courts are numerous and conflicting but those which broadly sustain the power greatly outnumber those which deny altogether or narrowly limit it; and it is very apparent that there is a constantly increasing tendency in the direction of the broader view. . . ."

The Court then cited *Aurora* v. *Burns*, 319 Ill. 84, 93: "If the municipal council deemed any of the reasons which have been suggested, or any other substantial reason, a sufficient reason for adopting the ordinance in question, it is not the province of the courts to take issue with the council. We have nothing to do with the question of the wisdom or good policy of municipal ordinances. If they are not satisfying to a majority of the citizens, their recourse is to the ballot—not the courts."

Then the Court goes on to say that experts concur in this broader view; that it is easier to provide fire apparatus, increase safety of homes, reduce street accidents, decrease noise, etc.

". . . These reasons are sufficiently urgent to preclude us from saying, as it must be said before the

ordinance can be declared unconstitutional, that such provisions are clearly arbitrary and unreasonable, having no substantial relation to the public health, safety, morals or general welfare."

11. The respondents submit that the plaintiff, by the act of the City Council in placing the locus in question in the R-3 district, has not suffered any greater disadvantage than may be suffered by any person on the border line of two districts; that the ownership of the adjoining land gives him greater opportunity to minimize such disadvantages; that there is no evidence in this case which shows it was the intent of the City Council to persecute any one or to abuse the powers vested in it; and that the plaintiff is not entitled to the relief prayed for in his bill.

By their Attorneys,
PETER J. NELLIGAN,
Cambridge City Solicitor,
J. EDWARD NALLY,
JOSEPH P. LYONS.

SUPREME COURT OF THE UNITED STATES.

No. 509.—October Term, 1927.

Saul M. Nectow, Plaintiff in Error, *vs.* City of Cambridge and Inspector of Buildings of the City of Cambridge, Jeremiah F. Downey.	In Error to the Supreme Judicial Court of the State of Massachusetts.

[May 14, 1928.]

Mr. Justice Sutherland delivered the opinion of the Court.

A zoning ordinance of the City of Cambridge divides the city into three kinds of districts: residential, business and unrestricted. Each of these districts is sub-classified in respect of the kind of buildings which may be erected. The ordinance is an elaborate one, and of the same general character as that considered by this Court in *Euclid* v. *Ambler Co.*, 272 U. S. 365. In its general scope it is conceded to be constitutional within that decision. The land of plaintiff in error was put in district R-3, in which are permitted only dwellings, hotels, clubs, churches, schools, philanthropic institutions, greenhouses and gardening, with customary incidental accessories. The attack upon the ordinance is that, as specifically applied to plaintiff in error, it deprived him of his property without due process of law in contravention of the Fourteenth Amendment.

The suit was for a mandatory injunction directing the city and its inspector of buildings to pass upon an application of the plaintiff in error for a permit to erect any lawful buildings upon a tract of land without regard to the provisions of the ordinance including such tract within a residential district. The case was referred to a master to make and report findings of fact. After a view of the premises and the surrounding territory, and a hearing, the master made and reported his findings. The case came on to be heard by a justice of the court, who, after confirming the master's report, reported the case for the determination of the full court. Upon

consideration, that court sustained the ordinance as applied to plaintiff in error, and dismissed the bill. — Mass. —.

A condensed statement of facts, taken from the master's report, is all that is necessary. When the zoning ordinance was enacted, plaintiff in error was and still is the owner of a tract of land containing 140,000 square feet, of which the locus here in question is a part. The locus contains about 29,000 square feet, with a frontage on Brookline street, lying west, of 304.75 feet, on Henry street, lying north, of 100 feet, on the other land of the plaintiff in error, lying east, of 264 feet, and on land of the Ford Motor Company, lying southerly, of 75 feet. The territory lying east and south is unrestricted. The lands beyond Henry street to the north and beyond Brookline street to the west are within a restricted residential district. The effect of the zoning is to separate from the west end of plaintiff in error's tract a strip 100 feet in width. The Ford Motor Company has a large auto assembling factory south of the locus; and a soap factory and the tracks of the Boston & Albany Railroad lie near. Opposite the locus, on Brookline street, and included in the same district, there are some residences; and opposite the locus, on Henry street, and in the same district, are other residences. The locus is now vacant, although it was once occupied by a mansion house. Before the passage of the ordinance in question, plaintiff in error had outstanding a contract for the sale of the greater part of his entire tract of land for the sum of $63,000. Because of the zoning restrictions, the purchaser refused to comply with the contract. Under the ordinance, business and industry of all sorts are excluded from the locus, while the remainder of the tract is unrestricted. It further appears that provision has been made for widening Brookline street, the effect of which, if carried out, will be to reduce the depth of the locus to 65 feet. After a statement at length of further facts, the master finds "that no practical use can be made of the land in question for residential purposes, because among other reasons herein related, there would not be adequate return on the amount of any investment for the development of the property." The last finding of the master is:

"I am satisfied that the districting of the plaintiff's land in a residence district would not promote the health, safety, convenience and general welfare of the inhabitants of that part of the defendant City, taking into account the natural development

thereof and the character of the district and the resulting benefit to accrue to the whole City and I so find."

It is made pretty clear that because of the industrial and railroad purposes to which the immediately adjoining lands to the south and east have been devoted and for which they are zoned, the locus is of comparatively little value for the limited uses permitted by the ordinance.

We quite agree with the opinion expressed below that a court should not set aside the determination of public officers in such a matter unless it is clear that their action "has no foundation in reason and is a mere arbitrary or irrational exercise of power having no substantial relation to the public health, the public morals, the public safety or the public welfare in its proper sense." *Euclid* v. *Ambler Co., supra,* p. 395.

An inspection of a plat of the city upon which the zoning districts are outlined, taken in connection with the master's findings, shows with reasonable certainty that the inclusion of the locus in question is not indispensable to the general plan. The boundary line of the residential district before reaching the locus runs for some distance along the streets, and to exclude the locus from the residential district requires only that such line shall be continued 100 feet further along Henry street and thence south along Brookline street. There does not appear to be any reason why this should not be done. Nevertheless, if that were all, we should not be warranted in substituting our judgment for that of the zoning authorities primarily charged with the duty and responsibility of determining the question. *Zahn* v. *Bd. of Public Works,* 274 U. S. 325, 328, and cases cited. But that is not all. The governmental power to interfere by zoning regulations with the general rights of the land owner by restricting the character of his use, is not unlimited, and other questions aside, such restriction cannot be imposed if it does not bear a substantial relation to the public health, safety, morals, or general welfare. *Euclid* v. *Ambler Co., supra,* p. 395. Here, the express finding of the master, already quoted, confirmed by the court below, is that the health, safety, convenience and general welfare of the inhabitants of the part of the city affected will not be promoted by the disposition made by the ordinance of the locus in question. This finding of the master, after a hearing and an inspection of the entire area affected, supported,

as we think it is, by other findings of fact, is determinative of the case. That the invasion of the property of plaintiff in error was serious and highly injurious is clearly established; and, since a necessary basis for the support of that invasion is wanting, the action of the zoning authorities comes within the ban of the Fourteenth Amendment and cannot be sustained.

Judgment reversed.

A true copy.

Test:

Clerk, Supreme Court, U. S.